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ABSTRACT

This report analyzes the performance of the portion of the graduating class of 1991 from the Houston (Texas) Independent School District (HSID) who took the Scholastic Aptitude Test (SAT) and related tests associated with the College Board's testing program. In 1991, 3,907 (52%) HISD students took the SAT; 556 (14.2%) of the HISD students who took the SAT also took one of the College Board Achievement Tests. Comparisons with data from 1987 reveal an increase in the proportion of minority students in Houston taking the SAT, with a decline in the number of native speakers of English, and an increase in the ethnic and socioeconomic diversity of the test takers. Despite a genuine gain in the scores of Black students, the gap between performance of Blacks, Mexican Americans and other Hispanics, and Whites indicates that the HSID is preparing more and more minority students for college, but has not been able to come to terms with the need. Those students who have taken a large number of academic courses are on a par with the top students nationwide. At the lower end of academic preparation, HSID's students score lower than comparable students nationwide. The analysis of the SAT results indicates that Houston, along with the nation as a whole, has not been able to adequately prepare significant groups of students for college work. Twenty-three graphs and 32 tables present achievement test results. A 15-item list of references is included. (SLD)

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The HISD Graduating Class of 1991: College Preparation and the SAT

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EXECUTIVE SUMMARY

THE HISD GRADUATING CLASS OF 1991: COLLEGE PREPARATION AND THE SAT

The Scholastic Aptitude Test (SAT) forms the first of four parts of the College Entrance Examination Board's Admissions Testing Program (ATP). The other three components of the ATP are the Test of Standard, Written English (TSWE), the Achievement Tests, and the Student Descriptive Questionnaire (SDQ). These four components, together with the secondary school record and other information, allow admissions and guidance personnel to evaluate an individual's readiness for college-level work.

HISD'S COLLEGE-BOUND POPULATION

In 1987, 3516 HISD students, or 43% of the graduating class, had taken the SAT; in 1991, 3907, or 52%, had SAT scores. In 1987, 404, or 11.5%, of HISD's SAT test-takers also took one of the Achievement Tests, designed to measure specific subject area knowledge and the ability to apply that knowledge. In 1991, 556, or 14.2% took an Achievement Test.

The ethnic make-up of HISD's SAT test group has changed greatly, evident even from just the past five years. While the proportion of the group made up by American Indians, Asians, and "Other" has remained fairly constant, the proportion made up by Blacks and Hispanics has increased and the proportion made up by White students has declined. HISD has seen a large increase in minority participation in the SAT, in numbers as well as proportions.

The proportion of the test group made up by native English speakers has declined over the past five years, from 79% to 74%. The proportion of students whose first language was other than English has increased significantly, from 9% in 1987 to 13% in 1991.

The proportion of the HISD test group made up by U.S. citizens has decreased from 92% in 1987 to 89% in 1991, while the proportion of permanent residents has increased from 7.5% to 10%. On this factor also, the diversity of the HISD test group is increasing.

The percent of HISD's SAT test-takers whose parents have attained a bachelor's degree or higher has declined over the past five years while the proportion of test-takers whose parents have a high school diploma or less has increased.

The mix of students in HISD's SAT test-taking group by household income level has also changed over the past five years. In 1987, those students whose parents earned $30,000 or less made up 51% of the test group; in 1991, that proportion rose to 55%. In 1987, those whose parents made more than $30,000 per year made up 49% of the test-taking group while in 1991 they make up only 45% of the group. Thus, HISD's test-taking group is getting poorer.

Between 1987 and 1991, the proportion of HISD's college-bound students who had taken a sufficient number of academic courses for college work rose while the proportion taking very few academic courses fell. In 1987, the proportion of test-takers who had taken 19 or more combined years of six academic subjects was 25%; by 1991 the proportion had risen to 30%. On the other end of the scale, the proportion of students who had taken 15 or fewer combined years of academic courses fell from 42% in 1987 to 30% in 1991. The average years of study of the six subject areas rose from 16.3 in 1987 to 16.9 in 1991. Nationally, however, the averages of 18.2 in 1987 and 18.7 in 1991 show that the average "American" student is far better prepared for college than the average HISD student.

HISD's SAT Scores • 1987–1991

The difference between White and Black scores and White and Hispanic Scores on the Verbal test should be noted. In 1987, the White student group averaged 109 points higher than the Black student group. In 1991, this difference had grown to 122 points. The three point drop in Black scores over this time may be a function of the fact that 223 more Black students took the test in 1991 than in 1987. Likewise, the 10 point rise in White scores may reflect the fact that there were 318 fewer White students tested in 1991 than in 1987. Whatever the explanation, the bottom line is that a large number of Black students who wish to pursue a college career have passed through the HISD educational system without becoming adequately prepared to successfully pursue that career.

The situation is similar for Hispanic students. In 1987, White students scored 89 points higher than Mexican Americans on the verbal subtest. By 1991 the difference had widened to 113 points. Over this period the Mexican American average score had fallen 14 points. For those listed as "Other" Hispanics, a similar pattern holds. The 67 point 1987 gap had widened to 109 points in 1991. The average score for "Other" Hispanics fell 32 points from 1987 to 1991. It is true that there were 396 more Hispanics taking the test in 1991 than in 1987. Looking only at scores and participation rates, one would expect scores to go down. Looked at in another way, however, HISD is being asked to prepare more and more minority students for college. The evidence suggests that the educational apparatus has not yet come to terms with this mandate.

On the 1987 math test, the average for the White student group was 117 points higher than that of the Black group. In 1991, the difference was 124 points. Looking simply at this gap can be misleading, however. Black students gained 11 points during that period; White students gained 18 points. Since the Black participation rate increased during this period, the gain in Black average scores must represent a genuine gain.

In 1987, the difference between White and Mexican American scores was 78 points on the math test. In 1991, that difference had grown to 96 points. The change is accounted for solely by the gains made by the White student group. The "other" Hispanic group, however, averaged 25 points lower on the 1991 math test than on the 1987 test. This drop, combined with the White increase, increased the gap between their scores and those of White students from 55 points to 98 points.

National/Texas/Houston Score Comparisons • 1991

Mean SAT scores increase with the level of parental education. The educational approach current throughout the United States is thus competent to prepare students from privileged backgrounds for college work but has not yet come to terms with the mandate to adequately educate students who do not come from homes with a tradition of educational achievement. Consistent with other indicators, HISD students who have highly educated parents can compete with their counterparts nationwide, while HISD students without highly educated parents perform below comparable students nationwide.

HISD's affluent students score as high or higher than such students nationwide, but HISD students from poor and middle income homes score lower than such students nationwide. The proportions of students in the test groups should be noted. In HISD, 30% of test-takers come from families making $40,000 or more; nationally, the figure is 50%. At the poorer end, 56% of HISD's test-takers come from families with incomes of $30,000 or less. Nationally, only 31% fit this criteria.

HISD's students who have taken a large number of academic courses are on a par with the top students nationwide. However, at the lower end of academic preparation, HISD's students score lower than comparable students nationwide.

The HISD Graduating Class of 1991: College Preparation and the SAT

This report analyzes the performance of the portion of HISD's graduating class of 1991 that took the Scholastic Aptitude Test and the tests associated with the College Board's Admissions Testing Program. The first section (p. 1) describes the SAT and the Admissions Testing Program. The second section (p. 2) points out several prominent misuses and misinterpretations of SAT scores aggregated by state, district or school. Unfortunately, the most egregious forms of misuse of SAT scores also remain the most popular forms of presentation, and encourage erroneous and misappropriate judgments. The third section (p. 4) describes the test group. The fourth section (p. 17) observes score trends in HISD and the fifth (p. 34) attempts to make judicious comparison of HISD scores to state and national scores without sacrificing all semblance of validity. The concluding section (p. 50) describes some of the suggestions for school reform that have been made in recent publications dealing with SAT results.

Certain conclusions will become evident as the report proceeds. In summary form, they are as follows:

- the ethnic make-up and economic and cultural backgrounds of the group of students that Houston ISD is charged with preparing for college-level work is changing;
- neither Houston ISD, the educational apparatus of the state of Texas, nor the educational efforts and perspectives of the nation as a whole has adequately come to terms with all the different kinds of students they are required to prepare for college. Thus, they are failing to adequately prepare significant groups of students for college-level work. The dominant approach to education throughout America, including Houston, has so far been inadequate to the job of preparing large groups of minority students, students from non-English speaking families, students from low income families, or students from families without a history of educational achievement for the academic demands of higher education.

Section I
The SAT and the Admissions Testing Program

The Scholastic Aptitude Test (SAT) forms the first of four parts of the College Entrance Examination Board's Admissions Testing Program (ATP). The other three components of the ATP are the Test of Standard, Written English (TSWE), the Achievement Tests, and the Student Descriptive Questionnaire (SDQ). These four components, together with the secondary school record and other information, allow admissions and guidance personnel to evaluate an individual's readiness for college-level work. The ATP thus provides information to college officials to help them make more rational judgments and decisions about college admissions, course placement and necessary remediation.

The SAT is a two-and-a-half hour multiple choice test designed to provide college admissions officials with a measure of developed verbal and quantitative abilities that are related to successful academic performance in college. The SAT is given in two 30-minute verbal sections and two 30-minute mathematical sections. The SAT also includes a 30-minute equating section that does not count toward scores, but is used to adjust the score scale to account for changes in the difficulty level of the test from year to year.

Thus, the SAT is used to "forecast" college academic performance. SAT scaled scores have a low of 200 and a high of 800, with a standard error of measurement of about 30 points. Like all test instruments, the SAT consists of a sample of test items derived from a universe of the possible test items that could address a given subject or skill. Thus, the score that a student obtains on the SAT will not be exactly equal to that student's true ability or knowledge, if he were tested using all possible test items. In practical terms, if the student were retested using an equivalent form, the obtained score of this second testing would not be exactly equal to the obtained score on the first test. The SAT score, like all other test scores, gives an estimate of a student's true score. The standard deviation of all the differences between the hypothetical true scores and the obtained scores can be estimated, and is called the standard error measurement. A student's true score will be within one standard error of measurement from his obtained score two-thirds of the time. In the case of the SAT, a student with an obtained score of 450 would most likely have a true score between 420 and 480. The verbal subscores of the SAT, reading comprehension and vocabulary, are reported on a scale of 20 to 80, with a standard error of about 4 points.

The Test of Standard, Written English (TSWE), a 30-minute, multiple-choice test measuring the ability to recognize the language used in most college textbooks, classroom lectures, research papers and written compositions, gives college advisors a measure to assist in the placement of students in first-year English courses. Scores fall between 20 and 80, but scores above 59 are reported as 60+, since the test is not designed to make reliable distinctions above that level. The standard error of measurement is about 3.5 points.

Achievement Tests are one-hour multiple choice tests given in a number of English, social studies, mathematics, foreign language, and science subjects, and are designed to measure subject area knowledge and the ability to apply that knowledge. The English Composition Test also contains an essay component. Scores range from 200 to 800 and have a standard error of measurement of about 30 points.

The Student Descriptive Questionnaire (SDQ) surveys the student's background, college plans, academic achievement and extracurricular activities to provide colleges with a supplement to a student's academic record and test scores. The SDQ is completed as part of the registration process for the SAT and response is voluntary. The SDQ is also used to supply information back to a student's high school and to various scholarship programs.

The College Board's "new" SAT, announced in October, 1990, will consist of the SAT-I: Reasoning and the SAT-II: Subject Tests. The SAT-I will be introduced in the spring of 1994 and is designed to emphasize critical reading and vocabulary in context. The SAT-I will allow calculators for the math test and will contain math questions that require students to produce answers rather than choose from predetermined options. The SAT-II will add new subject area tests in Asian languages and English as a Second Language, and will have a new Writing Test requiring a written essay. Also, the College Board plans to integrate the Achievement Tests and the SAT into a single, computerized test battery over the next decade.

Section II
Avoiding the Misuse and Misinterpretation of Aggregate Scores

The College Board provides aggregate scores for the SAT, the Achievement Tests, and the TSWE by nation, state, and district primarily as a context within which the scores of *individual* students become more meaningful. The various breakdowns of information along lines derived

from the SDQ allow admissions officers and guidance counselors to interpret a single student's performance within the context of the performance of other students who are similar on a number of academic and demographic variables.

A second use of the aggregate reports is to track changes over time of the type of students who are taking the tests and their levels of preparation. On a large scale, the population who takes the SAT stays relatively stable from year to year. Also, the difficulty of the test is statistically controlled from year to year to provide a stable means of comparison. Thus, comparisons of the various subgroups can be legitimately made from year to year.

The College Board and the American Council on Education have expressed the strongest possible concern about the misuse of SAT scores. Several cautions about the misinterpretation of test scores should be stressed. The relationships between test scores and the various educational, demographic and socioeconomic factors should not automatically be seen as a causal relationship. The only stated intent is to provide an indication of association between the factors and test performance. Causal relationships may or may not be present, but are in no way indicated as causal in the reported score breakdowns.

A second caution must be kept in mind. The use of SAT aggregate scores to directly compare or evaluate teachers, schools, districts or states is a blatant and pernicious misuse. In their 1988 *Open Letter to the Educational Community*, Donald Stewart, president of the College Board, and Robert Atwell, president of the American Council on Education, state that "the use of test score data in isolation, as a measure of quality with which to compare or rank-list colleges, is a clear misuse which should be curbed....The tests are meant to assess individual achievement and ability, not to compare the institutions students attend, or the schools, school districts, and states they hail from." Comparative rankings distort rather than clarify the real value of test data. Such comparison could be legitimately made only if a common test were administered to all, or a randomly selected subgroup, of the students being compared. The SAT is a self-selected test, and the proportion of students taking the test varies greatly by state, district and campus.

In *Guidelines on the Uses of College Board Test Scores and Related Data.*, the Council on Entrance Services of the College Board urges us to avoid the "inequitable or injurious" use of test data, and we are advised to guard against the use of tests for purposes they are neither intended to serve nor capable of serving. More specifically, the Council urges us to avoid:

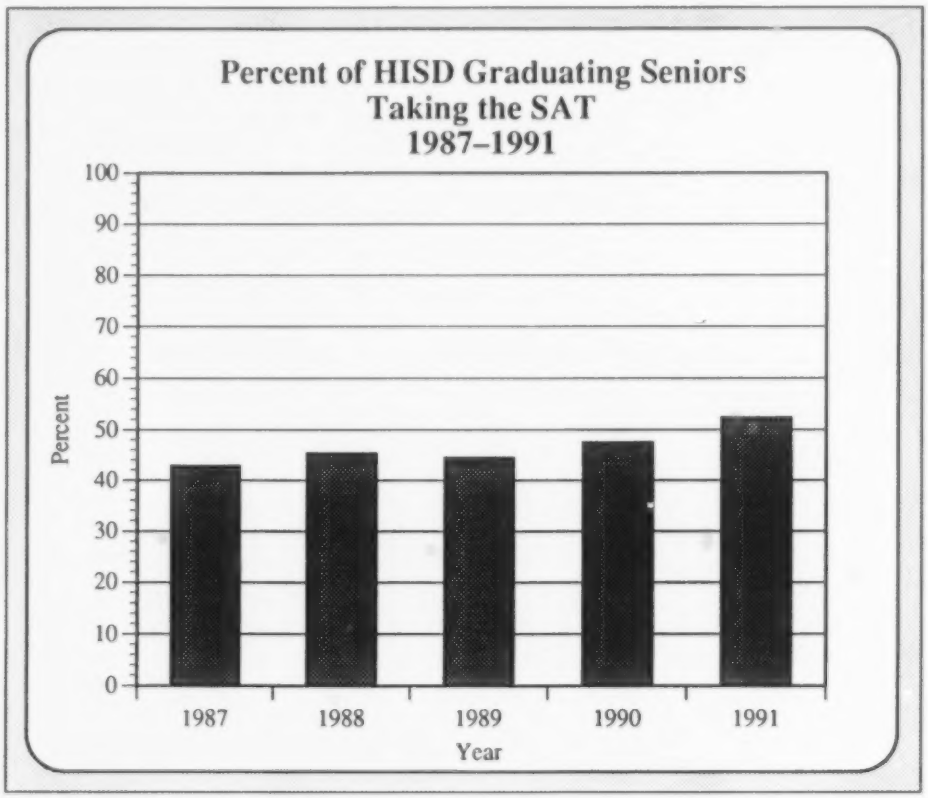
- use of the SAT or other tests as measures of the overall performance of students, teachers, educational institutions, districts, states, and other groups;
- encouraging the belief that the SAT measures a person's worth as a human being;
- the use of test scores as the sole basis for important decisions affecting the lives of individuals when better information is available;
- using SAT scores without appropriate consideration of their validity; and
- the discouragement of certain students from taking the SAT in an effort to increase a school's or district's average score.

Unfortunately, the most prominent forms of public presentation of SAT scores continue to contravene the first caveat.

Section III
HISD's College-Bound Population
1987–1991

Percent of Graduating Seniors Taking the SAT

The graph below gives the percent of HISD's 1991 graduating seniors who took the Scholastic Aptitude Test.



In 1987, 3516 HISD students, or 43% of the graduating class, had taken the SAT; in 1991, 3907, or 52%, had SAT scores.

Of the 3907 seniors graduating from HISD in 1991 with SAT scores, the large majority earned those scores in their senior year (3297, or 84%). Fifteen percent (602 students) graduated with SAT scores earned during their junior year and eight students had scores earned earlier.

The College Board's *Guidelines on the Uses of College Board Test Scores and Related Data* states that the "most significant factor in interpreting SAT scores is the proportion of eligible students taking the exam–the participation rate. In general, the higher the percentage of students taking the test, the lower will be the average score." This perspective has become common

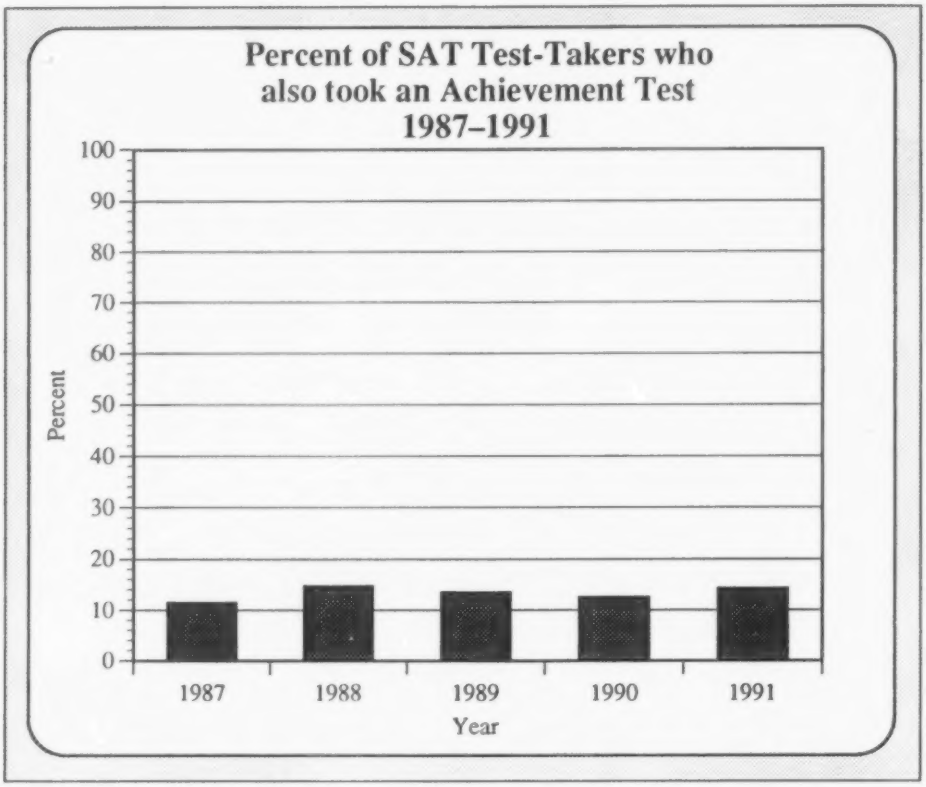
wisdom in interpreting SAT test scores. Powell and Steelman's 1984 paper on state-by-state comparisons demonstrated the unsoundness of direct comparisons of SAT statewide averages as an indication of educational quality without corrections for compositional and demographic factors: "a smaller percentage of test-takers more likely represents the highest test performers, whereas expanding the pool of test-takers necessarily implies the inclusion of lower performers." Their paper found a strong negative correlation between the percent of eligible test-takers participating in the SAT and SAT scores, concluding that 73.6 percent of the variation between state scores was accounted for when the percent of graduating seniors taking the test was taken into account. Powell and Steelman's results demonstrated that scores decreased by 2.76 points for each additional percent of students taking the test.

In a recent article on SAT performance in California schools, Mark E. Fetler provides an interesting nuance to the "complex relationship between demographic characteristics of students and performance on the SAT." At the school level in his study, participation rates were initially associated with higher scores, but when adjustments were made for parent education level, higher participation rates were negatively associated with scores. Fetler argues that the level of aggregation has to be taken seriously. At the school level, "more [socioeconomically] advantaged schools tend to have both higher rates of SAT participation and higher scores." This anomaly in the general pattern has a simple explanation, but should nevertheless make one sensitive to the level of score aggregation. "Schools with very high rates were mostly located in wealthier communities. Several other high participation schools have specialized programs and admit highly motivated and talented students by examination....Schools with zero or very low participation rates were located in the state's poorest areas, or else were rural or quite small." Thus, high participation rates go with high scores in socioeconomically advantaged and homogeneous schools and communities.

An interpretation of the results of a school district containing a wide variety of high schools located in a wide variety of neighborhoods with a wide variety of parental income and educational levels must take these remarks seriously. For HISD as a whole, the percentage of graduating seniors taking the SAT should have a profound effect on scores. In 1987, 3516, or 43% of the graduating class, HISD students had taken the SAT; in 1991, 3907, or 52%, had taken the test. A much higher proportion of HISD's graduating seniors take the SAT than in the nation as a whole (42% in 1991). Texas had a 1991 participation rate of 44%.

Achievement Test Takers

The graph below gives the percent of HISD's SAT test-takers who also took an Achievement Test. The College Board states that students who take Achievement Tests "tend to apply to selective colleges and universities and to score substantially higher on the SAT than other students.

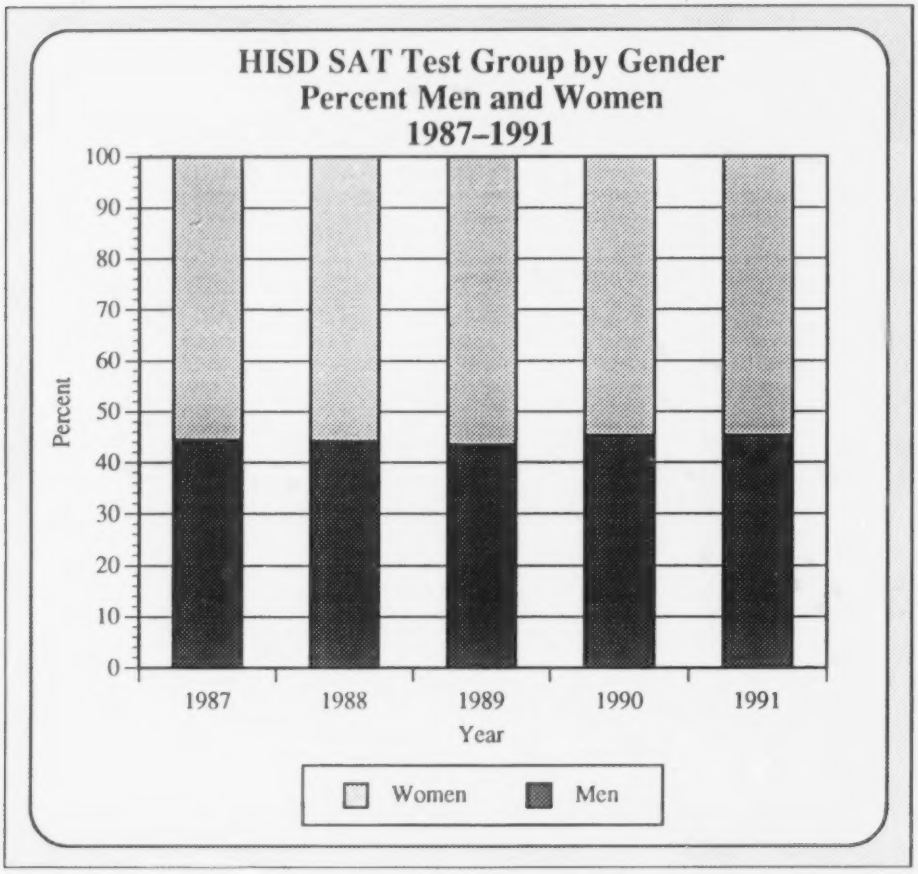


In 1987, 404, or 11.5%, of HISD's SAT test-takers also took one of the Achievement Tests, designed to measure specific subject area knowledge and the ability to apply that knowledge. In 1991, 556, or 14.2% took an Achievement Test.

Gender

The Student Descriptive Questionnaire asks for a number of variables that can give a school district an idea of some of the background factors of students with college aspirations. Some of these factors are beyond the control of the school system, and therefore represent those factors that a school district will have to come to terms with in its approach to education.

The graph below displays the percent of the total HISD test group made up by each gender.



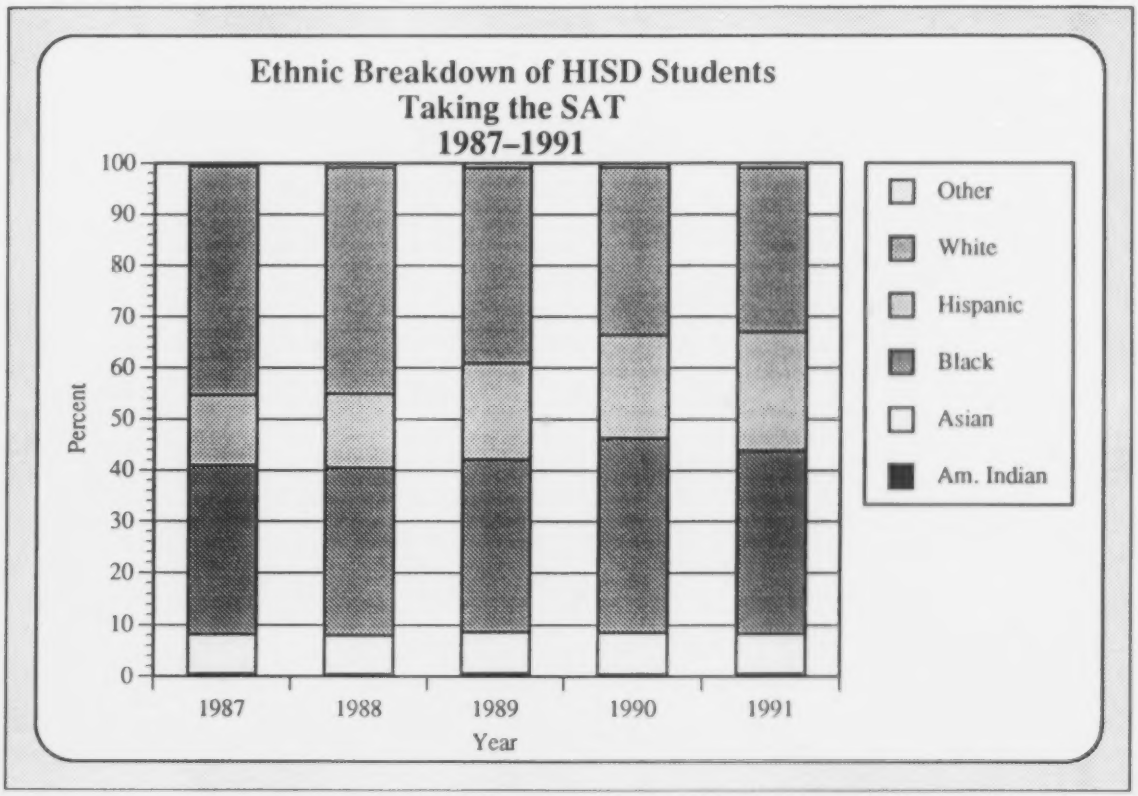
Women have outnumbered men in each of the past five years, with the proportion of men to women remaining fairly constant. In 1987, the 1568 men who took the SAT made up 44.6% of the test group; the 1948 women made up 55.4% of the group. In 1991, the 1773 men made up a slightly higher percentage of the test group (45.4) while the 2134 women made up a slightly lower percentage (54.6).

In 1991, women outnumbered men in each of the ethnic categories, with the exception of the small group of Puerto Ricans (5 men/4 women) and the "Other" category (21 men/13 women). The largest difference within an ethnic group between the number of men and women participating (not including the "other" category) was for black students, where 60% of SAT test-takers were women and only 40% men.

Powell and Steelman report that test performance varies by gender. On the SAT, men ordinarily surpass women on the mathematical test with SAT averages about 45 points higher than women. Nationally, women have traditionally outscored men on verbal tests, but men moved ahead in 1972 and, in 1991, scored 8 points higher than women. The gender composition of the test group thus has to be considered when dealing with SAT aggregate scores.

Ethnicity

The graph below displays the percent of the total HISD test group made up by each ethnicity. The three Hispanic categories (Mexican American/Puerto Rican/Other Hispanic) have been collapsed into one.



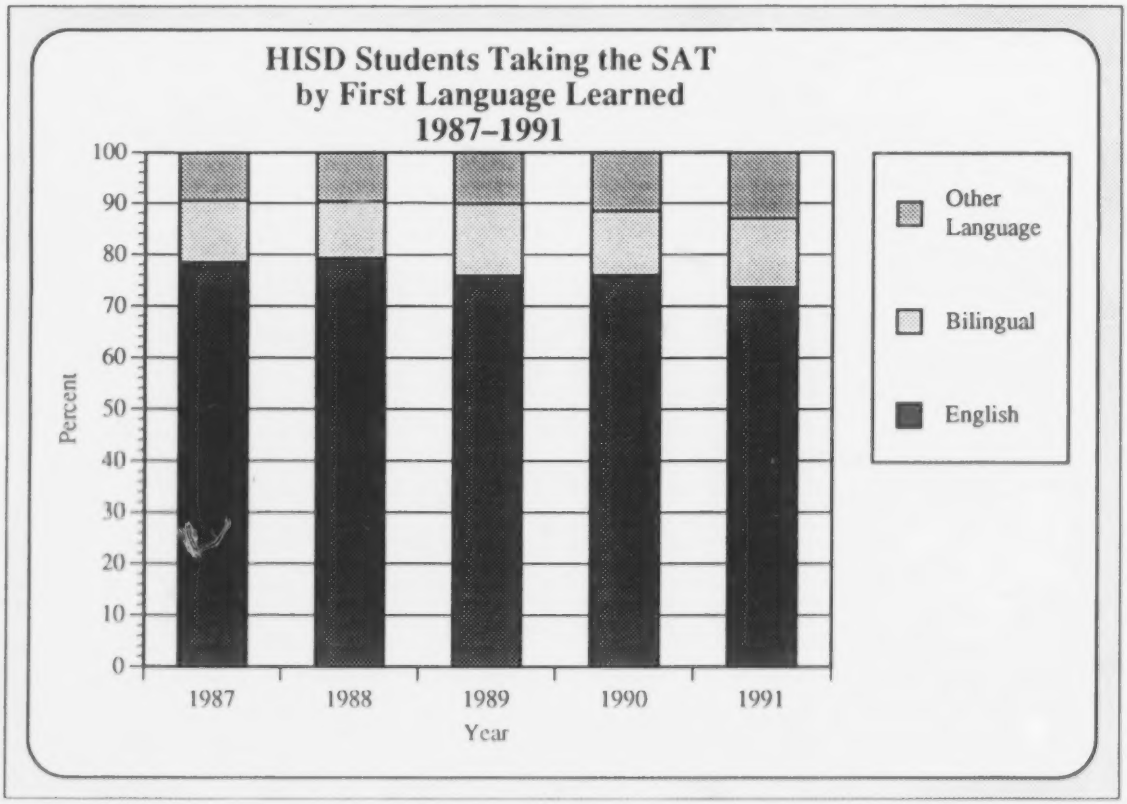
It is clear from the graph that the ethnic make-up of HISD's SAT test group has changed greatly, evident even from just the past five years. While the proportion of the group made up by American Indians, Asians, and "Other" has remained fairly constant, the proportion made up by Blacks and Hispanics has increased while the proportion made up by White students has declined. In 1987, the 1516 White students made up 45% of the test group; in 1991, 1198 White students made up 32% of the test group. In 1987, 1111 Blacks made up 33% of the test group; in 1991, 1334 Black students accounted for 36% of the test group. In 1987, 467 Hispanics accounted for 14% of the test group; in 1991, 863 Hispanics made up 23% of the group. Thus, HISD has seen a large increase in minority participation in the SAT, in numbers as well as proportions.

National figures show a similar, if somewhat disproportionate, trend. The proportion of the national test group made up by White students has declined from 78% in 1987 to 72% in 1991. The proportion accounted for by Black students has risen from 9% in 1987 to 10% in 1991 and the Hispanic portion has risen from 5% to 7%. Thus, at both the national and local level, the student test group has quickly become more ethnically diverse.

Because different levels of SAT performance tend to be associated with different ethnic groups, both the differences between the ethnic make-up of the test-taking groups at different levels of aggregation and the differences in ethnic make-up over time for the same district will have to be taken seriously when considering SAT scores.

First Language Learned

The graph below displays the percent of the total HISD test group made up by native English speakers, by students who grew up learning English and another language simultaneously, and by students who learned a non-English language first.

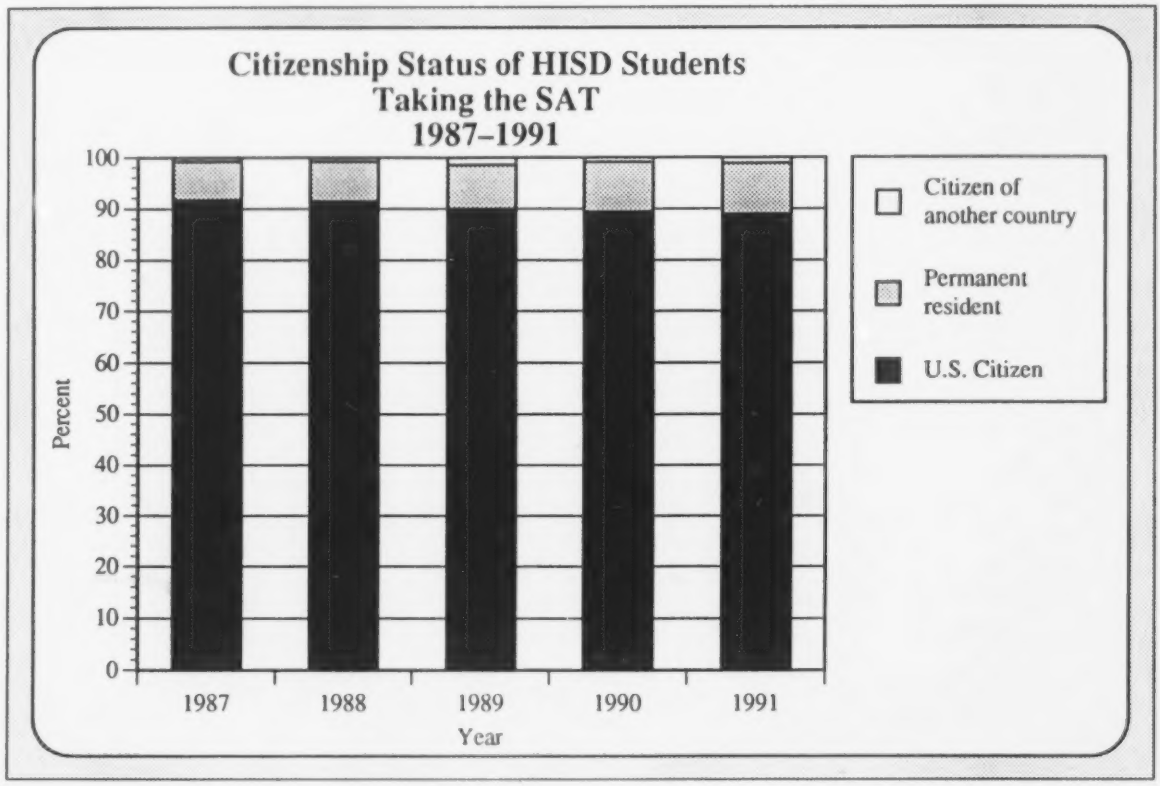


The proportion of the test group made up by native English speakers has declined over the past five years, from 79% to 74%, while the portion of students who learned English as well as another language has slightly increased, from 12% to 13%. The proportion of students whose first language was other than English has increased significantly, from 9% in 1987 to 13% in 1991.

Thus, the HISD test group is more linguistically diverse now than five years ago. National trends show a similar pattern, with the proportion of test-takers speaking English falling from 86% to 84% since 1987 and the proportion of test-takers speaking a language other than English rising from 5% to 8%.

Citizenship Status

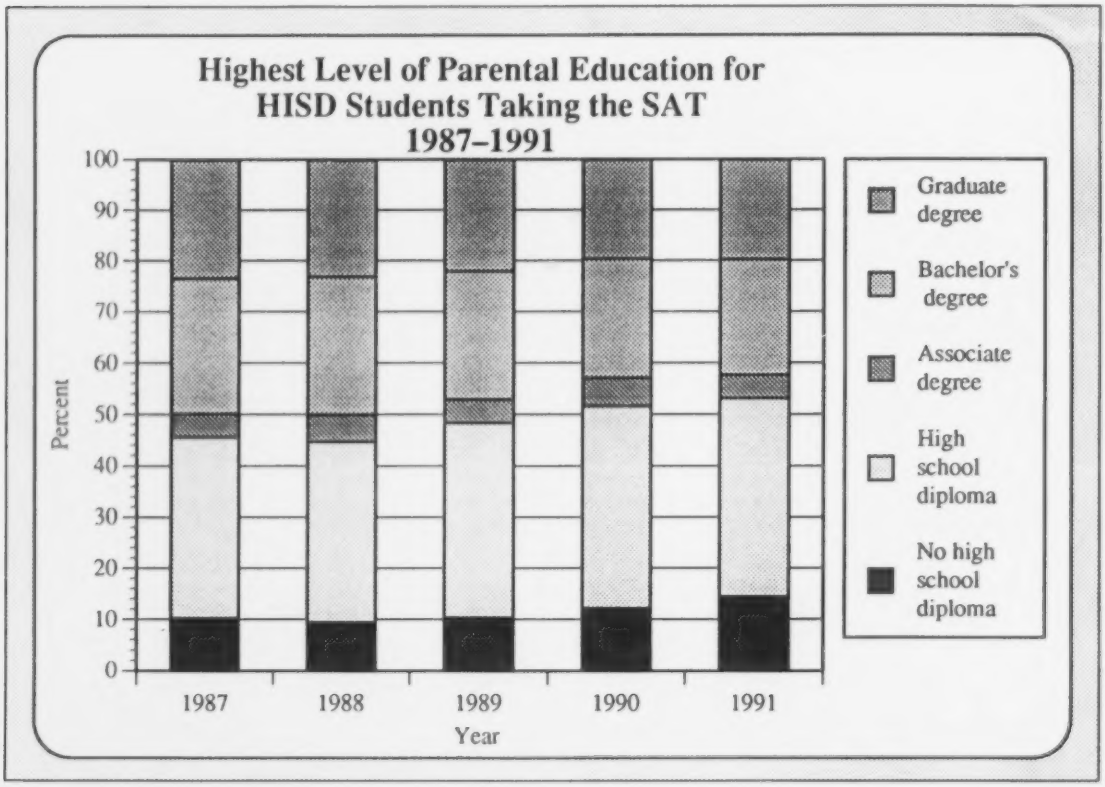
The graph below displays the percent of the total HISD test group formed according to the following citizenship categories: U.S. citizen, permanent resident, and citizen of another country.



The proportion of the HISD test group made up by U.S. citizens has decreased from 92% in 1987 to 89% in 1991. While the proportion of test-takers that are citizens of another country has remained steady at 1%, the proportion of permanent residents has increased from 7.5% to 10%. On this factor also, the diversity of the HISD test group is increasing. Over the same period, national figures show that the U.S. citizen portion dropped from 95% to 92%, the permanent resident category increased from 3% to 5%, and the citizen of other country category increased from 2% to 3%.

Parental Education

The graph below displays the percent of the total HISD test group of students whose parents have attained one of five levels of education.



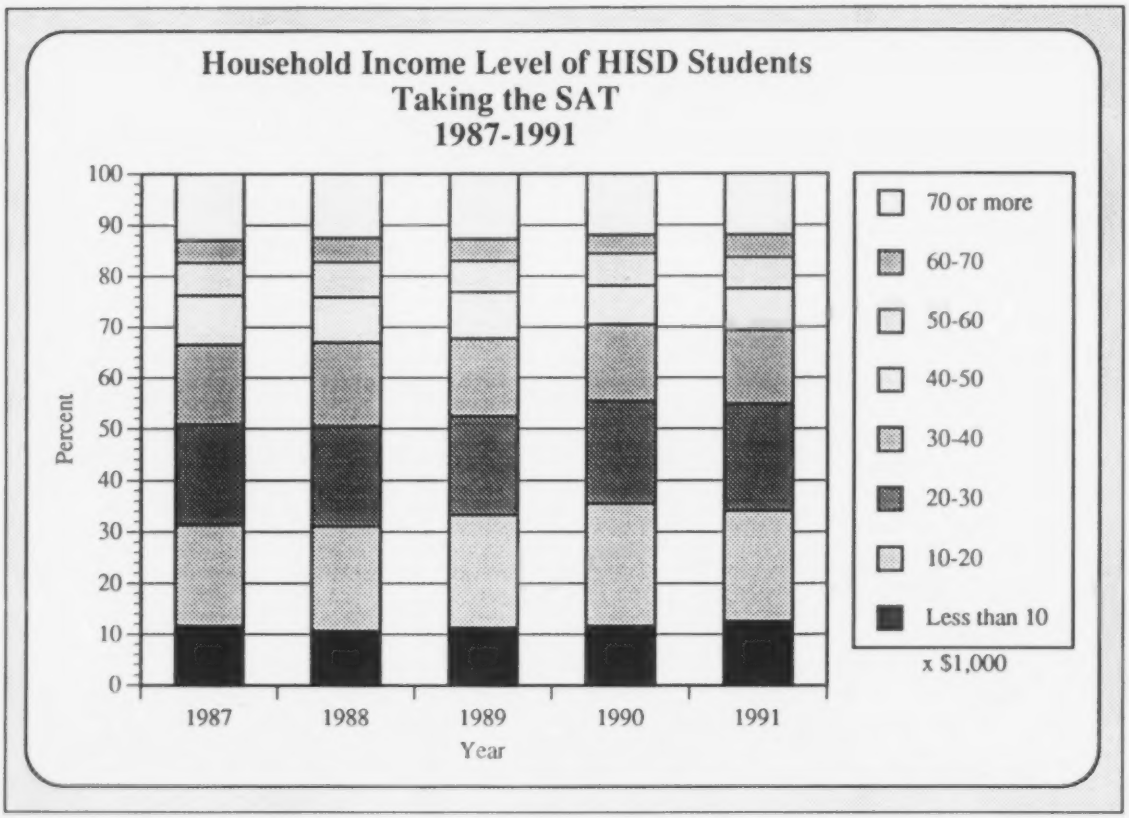
The graph clearly shows that the percent of HISD's SAT test-takers whose parents have attained a bachelor's degree or higher has declined over the past five years while the proportion of test-takers whose parents have a high school diploma or less has increased. From 1987 to 1991, the proportion of test-takers whose parents had not graduated from high school rose from 10% to 15%; the proportion whose parents had graduated from high school but had attained no further degree rose from 35% to 39%. Those whose parents had attained a bachelor's degree fell from 26% to 23% and those with parents having a graduate degree fell from 23% to 20%.

Over the same period at the national level, the proportion of test-takers whose parents had not finished high school rose from 4% to 5% while those whose parents had graduated high school remained at 38%. Students with parents having a bachelor's degree remained steady at 27% of the test group while those with parents having graduate degrees declined from 24% to 23%. Thus, HISD has experienced a significant change on this variable that is not strongly reflected in national trends.

Fetler's study of California schools finds a strong correlation between parent education and SAT scores. Thus, the levels of parental education will have to be considered when interpreting district or school averages.

Household Income

The graph below displays the percent of the total HISD test group of students whose parents' combined income falls into one of eight categories.



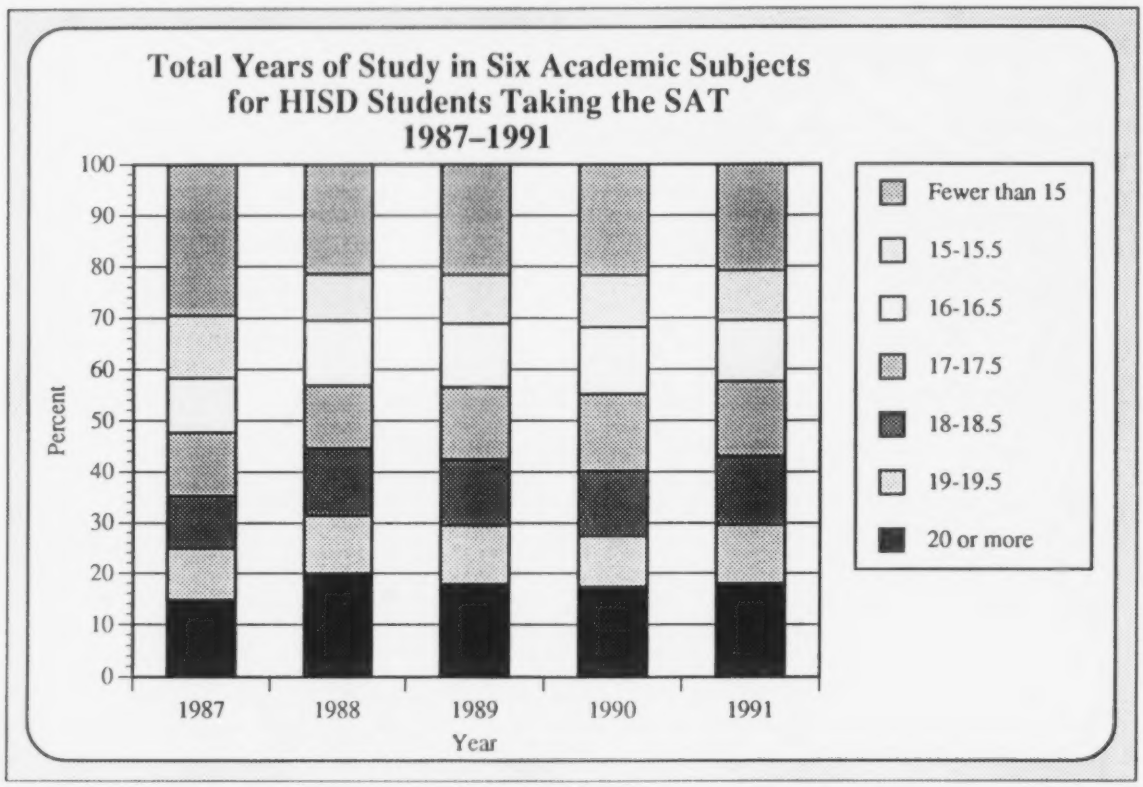
The mix of students in HISD's SAT test-taking group by household income level has also changed over the past five years. In 1987, those students whose parents earned $30,000 or less made up 51% of the test group; in 1991, that proportion rose to 55%. In 1987, those whose parents made more than $30,000 per year made up 49% of the test-taking group while in 1991 they make up only 45% of the group. Thus, HISD's test-taking group is getting poorer.

Since test performance varies directly with income level, the economic status of students must be taken into account when interpreting SAT scores.

Total Years of Study in Six Academic Subjects

Other information deriving from the Student Descriptive Questionnaire concerns factors that a school district does have some control over, such as a student's academic preparation for college.

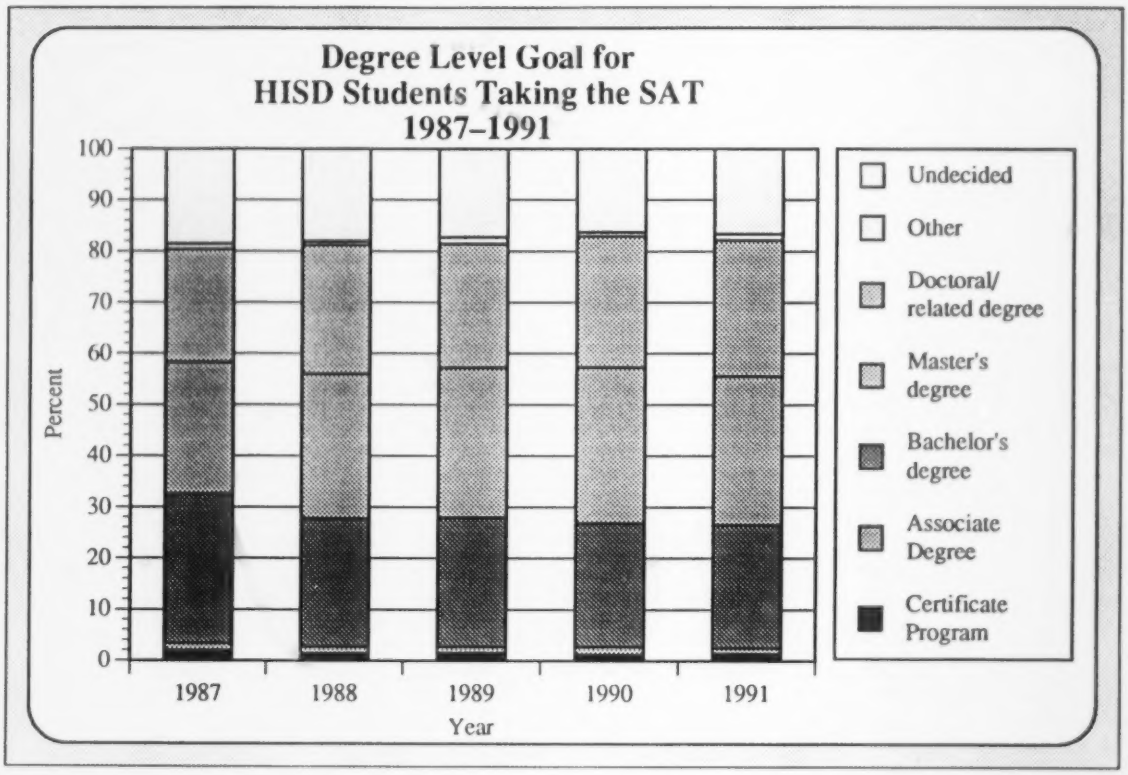
The graph below looks at student preparation for college. Students were asked to indicate the total number of years they had taken high school courses in Arts and Music, English, Foreign and Classical Languages, Mathematics, Natural Sciences, and Social Sciences. These were then summed and divided into seven categories. The graph displays the percentage of the test group that falls into each category.



Between 1987 and 1991, the proportion of HISD's college-bound students who had taken a sufficient number of academic courses for college work rose while the proportion taking very few academic courses fell. In 1987, the proportion of test-takers who had taken 19 or more combined years of six academic subjects was 25%; by 1991 the proportion had risen to 30%. On the other end of the scale, the proportion of students who had taken 15 or fewer combined years of academic courses fell from 42% in 1987 to 30% in 1991. The average years of study of the six subject areas rose from 16.3 in 1987 to 16.9 in 1991. Nationally, however, the averages of 18.2 in 1987 and 18.7 in 1991 show that the average "American" student is far better prepared for college than the average HISD student.

Degree Level Goal

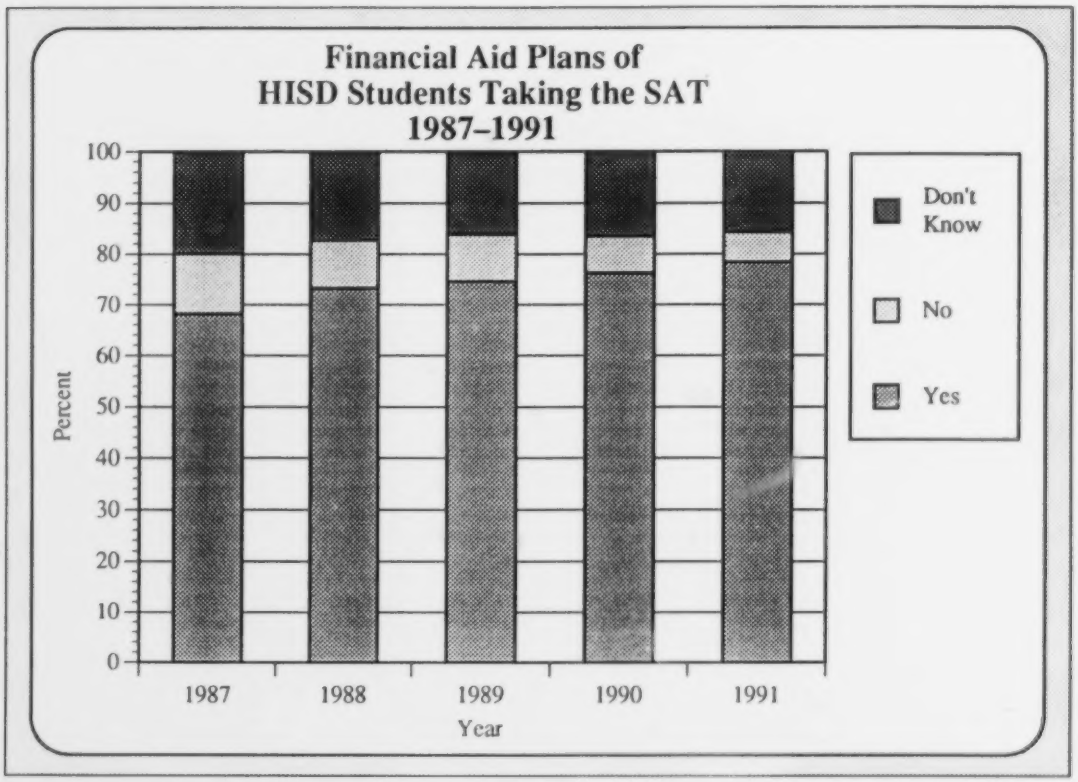
The graph below displays the percent of the total HISD test group according to the level of diploma students plan to pursue.



The educational aspirations of HISD students have increased over the past five years. More HISD students are planning to pursue higher level degrees. In 1987, 3.5% of the test-taking group planned only to pursue a certificate or associate degree; in 1991 that proportion was down to 2.5%. In 1987, 48% of the test-taking group planned to pursue either a master's degree or a doctorate; by 1991, that proportion was up to 56%.

Financial Aid Plans

The graph below displays the percent of the total HISD test group broken down by whether or not students plan to apply for financial aid.



More HISD students anticipate that college will be a financial burden for them. As in 1987, most of HISD's college-bound seniors plan to apply for financial aid. The proportion of the test-taking group with such plans, however, has increased from 68% to 78%. The proportion of students who do not have such plans dropped from 12% in 1987 to 6% in 1991.

Most Frequently Intended College Majors

The graph below displays the percent of HISD's college-bound seniors intending to pursue the following college majors. These were the four most frequently chosen majors.

Intended College Majors
(Four most frequently chosen majors • Percent of students)
1987–1991

	1987 %	1988 %	1989 %	1990 %	1991 %
Business Commerce	23	23	22	21	21
Health Allied Sciences	15	14	16	16	17
Engineering	11	10	11	13	13
Social Sciences	11	12	13	13	11

Number of Students Taking Achievement Tests

The graph below displays number of students taking each of the five most frequently taken Achievement Tests.

Students Taking Achievement Tests
(Five largest test groups • Number of students)
1987–1991

	1987	1988	1989	1990	1991
			# tested		
English Comp	393	521	467	434	537
Math I	283	349	299	311	367
Math II	117	180	174	173	195
Chemistry	114	138	111	113	102
Literature	80	104	103	68	92

In 1990, American History had 86 students.

Percent of Students Planning to Pursue Advanced Placement

The graph below displays the percent of students planning to pursue advanced placement status in college, for the four most frequently chosen subjects.

Plans to Pursue Advanced Placement
(Four most frequently chosen subjects • Percent of students)
1987–1991

	1987 %	1988 %	1989 %	1990 %	1991 %
English	28	28	29	26	28
Mathematics	23	23	23	22	23
Foreign Languages	13	13	14	12	12
Social Studies	10	11	12	12	10

Section IV • HISD's SAT Scores 1987–1991

Mean HISD SAT Scores

The following table presents average HISD scores for the past five years.

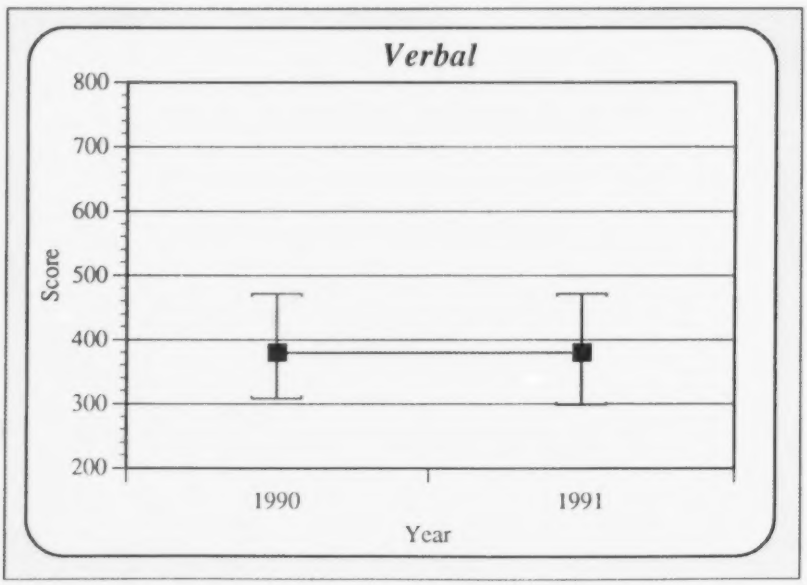
Mean HISD SAT Scores
1987–1991

Test	1987	1988	1989	1990	1991
Verbal	400	409	402	394	392
Math	448	458	453	444	448

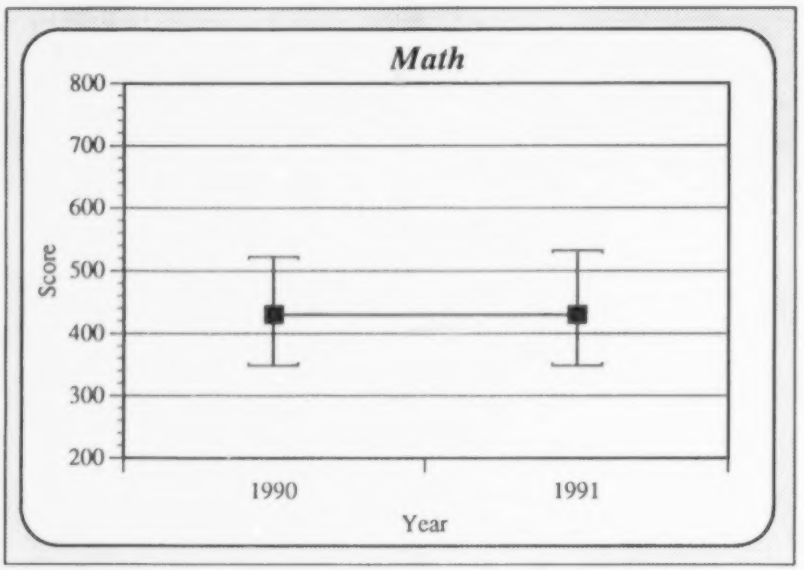
Of note is the eight point drop in verbal scores since 1987. In itself, this drop may merely signal an increase in the participation rate. Taking the 9 percentage point rise in participation rates from 1987 to 1991, Powell and Steelman's model would forecast a 25 point drop in total SAT scores over this five year period. In fact, math scores held steady and verbal scores dropped only 8 points.

The College Board and the Council of Chief State School Officers recommend supplementing the reporting of mean, or average, scores with a report of the highest and lowest scores of the middle 50 percent of students. These score bands will emphasize the diversity of abilities evidenced within particular institutions.

The following graphs provide such score breakdowns. Twenty-five percent of the obtained scores lie above the top bar in each column (the 75th percentile), another 25% between the top bar and the square dot (the 50th percentile), another 25% between this dot and the lower bar (the 25th percentile), and 25% below that bar. The College Board started reporting such score breakdowns in 1990.



The top 50% of HISD's scores have a similar profile in 1991 to their 1990 profile. Thus, in both years, 25% of the scores were above 470 and 25% of HISD's scores were between 380 and 470. However, the 25th percentile has dropped from 310 to 300. That drop signifies that the lowest 25% of HISD's verbal scores is now contained within a lower interval, that HISD had a larger group of low scorers in 1991 than in 1990.



In math, the cut-off points for the bottom 25% of scores and the bottom 50% of scores remained the same from 1990 to 1991. However, the 75th percentile rose from 520 to 530. Thus, the top 25% of HISD's scores lay at a higher level in 1991 than in 1990.

SAT Scores for Achievement Test Takers

The table below gives the SAT averages for those students taking one of the supplementary subject area Achievement Tests that are used to apply to the more selective colleges and universities. The College Board points with alarm to the continued gap between a highly educated "elite" and an academically ill-prepared "underclass."

Mean HISD Verbal SAT Scores
Total Group and Achievement Test Takers
1987–1991

Group	1987	1988	1989	1990	1991
Achievement Test Takers	538	544	538	533	529
Total Group	400	409	402	394	392
Difference	138	135	136	139	137

Mean HISD Math SAT Scores
Total Group and Achievement Test Takers
1987–1991

Group	1987	1988	1989	1990	1991
Achievement Test Takers	598	598	603	592	601
Total Group	448	458	453	444	448
Difference	150	140	150	148	153

SAT Scores by Gender

The following table presents average SAT Verbal scores by gender for the past five years.

Mean HISD Verbal SAT Scores by Gender 1987–1991

Gender	1987	1988	1989	1990	1991
Men	409	421	410	406	397
Women	394	400	395	384	387
Difference	15	21	15	22	10

The differences between average Verbal scores for men and women this year reached their lowest point in five years. However, this is indicative of a decline in performance for both genders. Men's scores declined 12 points while women's declined only 7. Of course, since the men's test group increased by 205 students over this period and the women's by 186, some decline in average scores should be expected.

The following table presents average SAT Math scores by gender for the past five years.

Mean HISD Math SAT Scores by Gender 1987–1991

Gender	1987	1988	1989	1990	1991
Men	477	483	478	474	471
Women	424	438	434	420	429
Difference	53	45	44	54	42

The differences between the performance of men and women is more extreme in math scores than in verbal. Five years ago, men scored an average 53 points higher than women. In 1991, that difference was only 42 points. In 1991, men's math scores were six points lower than five years ago; women's math scores were five points higher.

SAT Scores by Ethnicity

The following table presents average SAT Verbal scores by ethnicity for the past five years.

Mean HISD SAT Verbal Scores by Ethnicity 1987–1991

Ethnicity	1987	1988	1989	1990	1991	Difference (1987/1991)
American Indian	378	401	373	373	381	+ 3
Asian	381	385	405	414	425	+ 44
Black	346	355	353	350	343	– 3
Mexican American	366	382	371	368	352	– 14
Puerto Rican	412	—	371	357	359	– 53
Other Hispanic	388	380	368	363	356	– 32
White	455	462	462	460	465	+ 10
Other	382	437	393	404	436	+ 54

The difference between White and Black scores and White and Hispanic Scores should be noted. In 1987, the White student group averaged 109 points higher than the Black student group. In 1991, this difference had grown to 122 points. The three point drop in Black scores over this time may be a function of the fact that 223 more Black students took the test in 1991 than in 1987. Likewise, the 10 point rise in White scores may reflect the fact that there were 318 fewer White students tested in 1991 than in 1987. Whatever the explanation, the bottom line is that a large number of Black students who wish to pursue a college career have passed through the HISD educational system without becoming adequately prepared to successfully pursue that career.

The situation is similar for Hispanic students. In 1987, White students scored 89 points higher than Mexican Americans. By 1991 the difference had widened to 113 points. Over this period the Mexican American average score had fallen 14 points. For those listed as "Other" Hispanics, a similar pattern holds. The 67 point 1987 gap had widened to 109 points in 1991. The average score for "Other" Hispanics fell 32 points from 1987 to 1991. It is true that there were 396 more Hispanics taking the test in 1991 than in 1987. Looking only at scores and participation rates, one would expect scores to go down. Looked at in another way, however, HISD is being asked to prepare more and more minority students for college. The evidence suggests that the educational apparatus has not yet come to terms with this mandate.

The following table presents average SAT Math scores by ethnicity for the past five years.

Mean HISD SAT Math Scores by Ethnicity 1987–1991

Ethnicity	1987	1988	1989	1990	1991	Difference (1987/1991)
American Indian	429	423	384	419	418	– 11
Asian	521	508	529	516	534	+ 13
Black	379	396	396	392	390	+ 11
Mexican American	418	433	425	425	418	0
Puerto Rican	408	—	398	385	447	+ 39
Other Hispanic	441	447	429	419	416	– 25
White	496	503	505	505	514	+ 18
Other	407	460	458	436	481	+ 74

On the 1987 math test, the average for the White student group was 117 points higher than that of the Black group. In 1991, the difference was 124 points. Looking simply at this gap can be misleading, however. Black students gained 11 points during that period; White students gained 18 points. Since the Black participation rate increased during this period, the gain in Black average scores must represent a genuine gain.

In 1987, the difference between White and Mexican American scores was 78 points on the math test. In 1991, that difference had grown to 96 points. The change is accounted for solely by the gains made by the White student group. The "other" Hispanic group, however, averaged 25 points lower on the 1991 math test than on the 1987 test. This drop, combined with the White increase, increased the gap between their scores and those of White students from 55 points to 98 points.

The message from this analysis of math scores broken down by ethnicity is the same as that from verbal scores: an large number of minority students who aspire to a college education find themselves, after passing through the Houston educational system, unprepared to successfully achieve their goals.

SAT Scores by First Language Learned

The Student Descriptive Questionnaire requests several other types of information about factors that a school system has little control over, such as first language learned, citizenship status, highest level of parental education and household income level. The primary question to be asked about the information derived from these categories is whether they help us specify more exactly the type of student that is not benefiting from the current approach to education.

The table below presents the mean verbal scores of HISD college-bound seniors by first language learned.

Mean HISD Verbal SAT Scores by First Language Learned 1987–1991

Language	1987	1988	1989	1990	1991
English	409	418	411	402	400
English & Another	382	393	389	380	376
Other Language	357	357	361	370	362

It is, of course, understandable that there should be a large gap on the verbal score between the averages of those who learned English first and those who first learned other languages. Nevertheless, as the College Board says, most college work is done in English. Since the proportion of its college-bound population that learned first a language other than English has increased from 9% in 1987 to 13% in 1991, Houston ISD will have to come to terms with the task of preparing for college-level work large numbers of students who did not learn English as their first language.

The table below presents the mean math scores of HISD college-bound seniors by first language learned.

Mean HISD Math SAT Scores by First Language Learned 1987–1991

Language	1987	1988	1989	1990	1991
English	447	460	453	444	448
English & Another	436	444	445	444	438
Other Language	476	463	474	458	458

Math averages derived from this variable, of course, paint an entirely different picture from verbal averages. In fact, those students who did not grow up bilingual and who also did not learn English as their first language scored higher on the Math test than the other two groups.

SAT Scores by Citizenship Status

The table below presents the mean verbal scores of HISD college-bound seniors by citizenship status.

Mean HISD Verbal SAT Scores by Citizenship Status 1987–1991

Citizenship Status	1987	1988	1989	1990	1991
U.S. Citizen	406	415	409	400	397
Permanent Resident	343	349	348	353	350
Citizen of Another Country	360	366	363	318	363

The verbal averages for students who are not U.S. citizens are consistently lower than the averages for U.S. citizens. The portion of the test group made up of U.S. citizens has declined from 92% in 1987 to 89% in 1991. Thus, HISD will have to come to terms with preparing for college a larger group of students coming from more diverse backgrounds than before.

The table below presents the mean math scores of HISD college-bound seniors by citizenship status.

Mean HISD Math SAT Scores by Citizenship Status 1987–1991

Citizenship Status	1987	1988	1989	1990	1991
U.S. Citizen	447	458	454	445	448
Permanent Resident	468	461	451	446	445
Citizen of Another Country	451	450	492	447	471

The consistent differences in score averages between citizenship groups that was seen in verbal scores is not in evidence in math scores. This suggests that the citizenship variable works as a proxy for language proficiency.

SAT Scores by Highest Level of Parental Education

The table below presents the mean verbal scores of HISD college-bound seniors by the highest level of parental education.

Mean HISD SAT Verbal Scores by Highest Level of Parental Education 1987–1991

Parental Education	1987	1988	1989	1990	1991
No High School Diploma	344	347	335	339	327
High School Diploma	363	376	370	365	361
Associate Degree	390	383	377	382	377
Bachelor's Degree	427	427	431	420	423
Graduate Degree	459	472	464	465	470

Average verbal scores rise as the level of parental education rises. In 1987, there was a gap of 115 points between the average of students with a parent having a graduate degree and students who parents lacked a high school diploma. In 1991, the difference was 143 points. It needs to be noted that the proportions of the test group made up by students from homes where parents have not gone beyond high school has increased, from 45% to 54% of the test group.

The clear lesson from this variable is that the current approach to education works well enough for students coming from a background of parental educational achievement. The current educational apparatus has not yet come to terms with the task of preparing for college large numbers of students from families without a history of educational attainment.

The table below presents the mean math scores of HISD college-bound seniors by the highest level of parental education.

Mean HISD SAT Math Scores by Highest Level of Parental Education 1987–1991

Parental Education	1987	1988	1989	1990	1991
No High School Diploma	406	415	408	403	400
High School Diploma	410	427	422	415	415
Associate Degree	431	426	422	427	425
Bachelor's Degree	474	478	480	468	476
Graduate Degree	502	512	510	512	524

Average math scores also rise as the level of parental education rises. In 1987, there was a gap of 96 points between the average of students with a parent having a graduate degree and students who parents lacked a high school diploma. In 1991, the difference was 124 points.

SAT Scores by Household Income Level

The table below presents the mean verbal scores of HISD college-bound seniors by household income level.

Mean HISD SAT Verbal Scores by Household Income Level 1987–1991

Income	1987	1988	1989	1990	1991
Less Than $10,000	337	338	327	337	322
$10,000-$20,000	359	376	364	360	357
$20,000-$30,000	392	398	392	381	380
$30,000-$40,000	413	419	409	402	398
$40,000-$50,000	414	433	428	417	409
$50,000-$60,000	432	441	442	438	419
$60,000-$70,000	460	457	460	440	461
$70,000 or More	471	472	480	472	489

The first point to be noticed is that the average score rises as the household income level rises. This pattern is consistent across all five years. This pattern suggests that, while the approach to education in the Houston Independent School District is adequate for those from more affluent homes, it fails to adequately prepare students from poorer homes for college-level work. Of course, scores nationwide show the same pattern. This simply means that the approach to education that is current throughout the United States has not yet come to terms with the educational needs of large numbers of poor students.

The second point of note is the fact that the distance between the average scores for the most affluent students and those from poorer backgrounds has widened since 1987. In 1987, 134 points separated the scores of the students from the highest income category from those of the lowest. In 1991, the difference was 167 points. Only the top two income categories showed score gains over 1987.

The table below presents the mean math scores of HISD college-bound seniors by household income level.

Mean HISD SAT Math Scores by Household Income Level 1987–1991

Income	1987	1988	1989	1990	1991
Less Than $10,000	399	410	400	396	390
$10,000-$20,000	410	425	423	410	414
$20,000-$30,000	432	447	443	431	438
$30,000-$40,000	458	465	454	447	452
$40,000-$50,000	464	478	472	465	457
$50,000-$60,000	479	472	491	482	467
$60,000-$70,000	513	505	498	490	517
$70,000 or More	517	521	527	528	541

In math, as in the verbal test, average scores rise with household income level. In 1987, a 118 separated the scores of those students in the highest income level from those in the lowest. In 1991, the gap was 151 points. These indications lead to the same lessons as those noted on the verbal test. While current educational practice works well enough for students from affluent backgrounds, there are large numbers of poorer students who are not being adequately prepared for college-level work.

SAT Scores by Total Years of Study in Six Academic Subjects

The Student Descriptive Questionnaire also provides information on variables that school districts can have some control over, such as several academic preparation variables. One of these, the total years of study in six academic subjects, seems particularly useful. Students are asked to indicate the total years of coursework they have taken in English, Arts and Music, Social Sciences and History, Foreign and Classical Languages, Natural Sciences, and Mathematics. Their answers are summed to create an overall index of academic preparation. The table below presents verbal means by seven levels of academic preparation.

Mean HISD Verbal SAT Scores by Total Years of Study in Six Academic Subjects 1987–1991

Years of Study	1987	1988	1989	1990	1991
20 or more years	496	509	495	492	485
19 or 19.5 years	458	452	456	437	452
18 or 18.5 years	443	428	436	414	410
17 or 17.5 years	417	406	403	399	393
16 or 16.5 years	402	380	374	380	370
15 or 15.5 years	370	363	376	360	339
Fewer than 15 years	339	342	329	332	321

In general, the more academic coursework, the higher the score. In 1987, the difference between the average scores of those students who had complete 20 or more years of combined coursework from those who had completed fewer than 15 years was 157 points on the verbal test. In 1991, the difference was 164 points.

The table below presents math score means by seven levels of academic preparation.

Mean HISD Math SAT Scores by Total Years of Study in Six Academic Subjects 1987–1991

Years of Study	1987	1988	1989	1990	1991
20 or more years	564	563	551	547	546
19 or 19.5 years	514	515	520	499	514
18 or 18.5 years	491	485	492	473	471
17 or 17.5 years	460	452	450	447	447
16 or 16.5 years	450	423	426	424	427
15 or 15.5 years	412	408	412	400	399
Fewer than 15 years	378	386	382	381	376

The pattern observed with respect to verbal means also pertains in the case of math scores. The more academic coursework, the higher the math score. In 1987, the difference between the average scores of those students who had completed 20 or more years of combined coursework from those who had completed fewer than 15 years was 186 points on the verbal test. In 1991, the difference was 170 points.

Of note is the fact that, in 1991, 31% of the test group of college-bound seniors had completed fewer than 16 years of combined academic coursework. This is down from the 41% figure registered in 1987, but still shows that a great number of HISD students who aspire to a college career are not aware of the factors that will help them be successful in this endeavor.

The following remarks about academic preparation concern only college-bound seniors of 1991.

Academic Preparation: English Coursework/Experience

Most of the college-bound seniors from the class of 1991 (80%) had taken four years of English coursework. Their average verbal score of 396 was higher than the 365 averaged by the 14% of test-takers to have taken only three or three and a half years of English coursework. Their math average of 452 was also higher than the 427 of the other group.

The verbal average of 449 by the 45% of test-takers who had taken British Literature was higher than any other verbal average associated with particular English coursework. Students who had taken a literature course focusing on a literature other than British or American (25%) had the second highest verbal average, at 447. These groups also achieved the highest math averages to be associated with English coursework (Literature-Other Country: 505; British Literature: 500).

The 38% of test-takers who had taken honors courses in English averaged 461 on the verbal test and 520 in math.

Academic Preparation: Arts & Music Coursework/Experience

Students who had taken Acting/Play Production, Drama Appreciation, or Music Appreciation averaged 429 on verbal. The averages of students who had taken Photography/Film and Studio Art and Design were close behind.

The 6% of test-takers who had taken honors courses in Arts and Music averaged 495 on the verbal test and 551 in math.

Academic Preparation: Social Sciences & History Coursework

Most students (79%) had taken at least three years of Social Sciences and History coursework. Students who had taken more than four years (3%) scored much higher in both verbal and math (Verbal: 459; Math: 501) than students who had not had so complete a course load (4 years of study: Verbal: 403; Math: 447).

A very high math average of 534 was recorded by the 4% of test-takers who had taken an anthropology course. The anthropology students also recorded the highest verbal average, 482. The second highest scores were recorded by the 3% of test-takers who had taken ancient history (Verbal: 429; Math: 480).

The 32% of test-takers who had taken honors courses in Social Science and History averaged 470 on the verbal test and 531 in math.

Academic Preparation: Foreign & Classical Languages Coursework

Most students (56%) reported having taken 2 or 2.5 years of foreign language coursework. Their verbal average (396) was far below the 507 verbal score for the 2% of students with more than 4 years of study and the 7% with 4 years of study (Verbal: 506). The 452 math average was also far below the 576 posted by students with 4 years of foreign language study and the 566 for students with more than 4 years of study.

The highest verbal averages for particular coursework was posted by the 1% of students having taken Italian (488), the 5 students who had taken Greek (486), and the 2% who had taken Russian (483). The highest math score associated with foreign language coursework was posted by the 1% who had taken Modern Hebrew.

The 17% of test-takers who had taken honors courses in Foreign and Classical Languages averaged 499 on the verbal test and 566 on math.

Academic Preparation: Natural Sciences Coursework

The 48% of the test taking group who had taken 3 or 3.5 years of coursework in natural science attained a verbal average of 402 and a math average of 457. In contrast, the 4% who had taken more than four years averaged 483 in verbal and 583 in math.

Those students who had taken Physics (29%) achieved the highest verbal average (438) and the highest math average (518) associated with specific natural science coursework. The second highest math average (476) was posted by Chemistry students (74%).

The 30% of test-takers who had taken honors courses in the Natural Sciences averaged 467 on the verbal test and 539 in math.

Academic Preparation: Mathematics Coursework

The 44% of test-takers who had taken 3 or 3.5 years of math averaged 408 on the math SAT. In contrast, the 11% who had taken more than 4 years of math coursework averaged 535 in math. This group of students also achieved the highest average (444) on the verbal test for scores associated with the amount of mathematics coursework.

The 15% of students who had taken Calculus had the highest math average on the SAT (593), followed by the 33% who had taken Precalculus (545). These students also posted the highest verbal scores associated with particular mathematics coursework (Calculus: 494; Precalculus: 464).

The 30% of test-takers who had taken honors courses in Mathematics averaged 469 on the verbal test and 551 in math.

Academic Preparation: Computer Coursework/Experience

The highest math averages came from students who had used a computer to solve natural science problems (496) or math problems (480). Other applications of a computer, though, produced math averages that were only slightly below these scores. The 13% of students with no computer experience, however, had a drastically lower math average (408).

Verbal Subscores

The tables below present HISD scores on the Reading Comprehension and the Vocabulary sections of the verbal test, by gender. The subscore scale ranges from 20 to 80.

Mean HISD Reading Comprehension Scores by Gender 1987–1991

Test Group	1987	1988	1989	1990	1991	Difference (1987/1991)
All	40.2	41.0	40.3	39.6	39.2	– 1.0
Male	41.0	42.2	40.8	40.6	39.6	– 1.4
Female	39.6	40.0	39.9	38.7	38.9	– 0.7
Difference	1.4	2.2	0.9	1.9	0.7	

Mean HISD Vocabulary Scores by Gender 1987–1991

Test Group	1987	1988	1989	1990	1991	Difference (1987/1991)
All	40.1	41.1	40.4	39.6	39.5	– 0.6
Male	40.9	42.1	41.5	40.8	40.2	– 0.7
Female	39.4	40.2	39.5	38.5	38.9	– 0.5
Difference	1.5	1.9	2.0	2.3	1.3	

Note that men have posted higher scores on both subscales for each of the past five years, and that the average score for both men and women has declined over the past five years.

Test of Standard Written English (TSWE)

The table below gives average scores for the Test of Standard Written English (TSWE) for HISD for the past five years, by gender.

Mean HISD TSWE Scores by Gender 1987–1991

Test Group	1987	1988	1989	1990	1991	Difference (1987/1991)
All	41.5	42.6	41.6	40.5	39.9	– 1.6
Male	41.0	42.3	41.0	40.3	39.2	– 1.8
Female	41.8	42.9	42.2	40.7	40.5	– 1.3
Difference	0.8	0.6	1.2	0.4	1.3	

Of note is the fact that, while men posted higher scores than women on both subscores of the verbal SAT, women scored higher than men on the TSWE, in each of the past five years.

Section V
National/Texas/Houston ISD Score Comparisons
1991

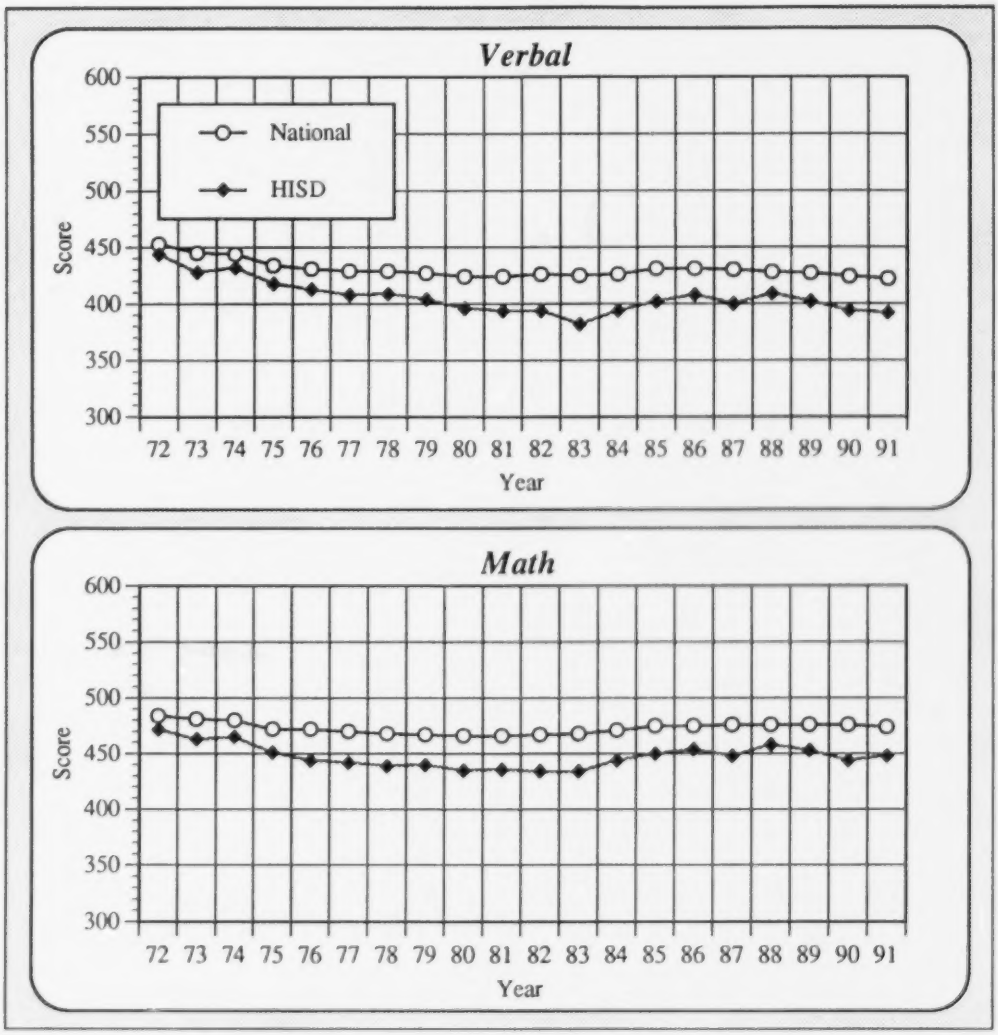
Overall Mean Scores • 1972–1991

The following graphs are similar in form and content to those used most frequently to communicate SAT scores to the public. The other primary means of communicating SAT results to the public is through comparative lists. Judgments about the quality of educational institutions are customarily attached. The College Board has strongly denounced such judgments as "inherently unfair," a "misuse," and "inappropriate."

Unlike the presentation in the Texas Research League's July edition of *Analysis*, which begins with such a presentation, renders it questionable and then brings in other factors to make the scores understandable, the usual presentation rests its entire interpretation of the educational quality of institutions on a glance at mean score trends. Such cursory "analysis" does point to certain "facts" legitimately, such as the fact that one school district has different scores than another. However, the intellectual leap which raises such disconnected facts of the "so what?" variety to the status of evidence within a judgment about the quality of an educational institution has no legitimacy, and can only amount to an instance of either farce or bad faith.

What legitimate function then can such a presentation perform? In the first place, average scores, when tracked over a number of years and when dealing with similar population make-ups, can be used to facilitate an understanding of the academic preparation of the test-takers. Second, such information can give rise to questions which cause one to pursue a deeper understanding of a student body's preparation for college. It can lead to both an appreciation of those important factors over which a school district has little control and must constructively accommodate and a recognition of factors that are currently inadequate and which can be modified.

Mean SAT Score Trends
National/Houston ISD
1972–1991

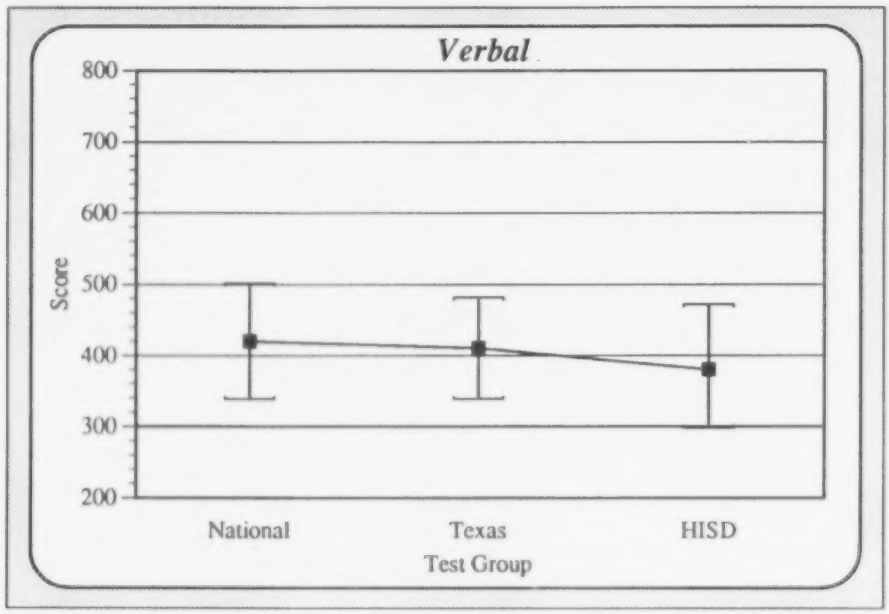


The scores tracked above show HISD average scores running on a line below national average scores, exhibiting in 1991 a 30 point difference between verbal means (National: 422; HISD: 392) and a 26 point difference between math means (National: 474; HISD: 448). We will have to ask after those factors that account for this difference and after what these factors teach us.

As mentioned in an earlier section, the College Board and the Council of Chief State School Officers have recommended that the reporting of mean scores be supplemented with reports of the highest and lowest scores of the middle 50 percent of students. These score bands emphasize the diversity of abilities evidenced within particular institutions, and help make clear the overlap of performances between institutions.

Verbal Scores

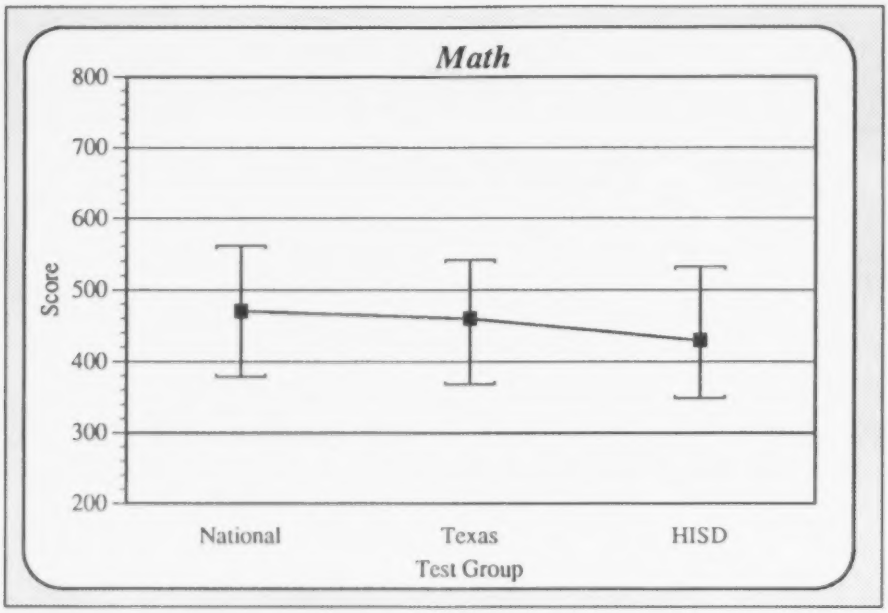
The following graphs provide such score breakdowns. Twenty-five percent of the scores will lie above the top line in each column (the 75th percentile), another 25% between the top line and the square dot (the 50th percentile), another 25% between this dot and the lower line (the 25th percentile), and 25% below that line.



The above graph shows that a greater proportion of HISD's students cluster toward the bottom of the scale than is the case nationwide or statewide. Fifty percent of HISD's scores fall below 380, while the bottom 50% of state scores reach up to 410 and that of the nation to 420. The bottom 25% of HISD's scores lie below 300, while this portion of scores extends up to 340 for the state and the nation. The top 25% of HISD's verbal scores are distributed above 470, while those of the state lie above 480 and those of the nation above 500. Thus, many of HISD's students do quite well on the verbal test.

Thus, while the top 25% of HISD's verbal scores may not differ significantly from those statewide, HISD has a larger proportion of students with very low scores than either the nation or the state. This is precisely the situation envisioned by Steelman and Power in pointing out the significance of participation rates on test scores: "a smaller percentage of test-takers more likely represents the highest test performers, whereas expanding the pool of test-takers necessarily implies the inclusion of lower performers." In 1991 HISD had a participation rate of 52%, compared to 42% for the nation and 44% for the state.

Math Scores



A situation prevails in math which is similar to that of the verbal scores. The lower 25% of HISD's math scores fall below 350, while these levels are 370 for Texas as a whole and 380 for the nation. The highest 25% lie above 530 for HISD, above 540 for the state, and above 560 for the nation. Again, many of HISD's student achieve very high scores on the SAT.

A genuine concern, however, should be the large group of HISD students clustering toward the bottom of the score scale. The explanation for such a large number of low scores may again be the fact that a large proportion of HISD's graduating seniors take the test. Thus, a simple comparison to the state and the nation really reveals very little about the quality of HISD's educational program when participation rates are taken into account. However, the fact that so many students – in HISD, the state, and the nation as a whole – take the SAT but score so low on it does say something about the educational quality of all three levels that must be taken seriously: many students who wish to pursue a college education are coming to the end of their high school careers unprepared for a college career.

SAT Scores and Students Who Take Achievement Tests

The following tables present the differences between the SAT mean scores of those students who also took one or more of the Achievement Tests and the SAT mean as a whole. According to the College Board, students who take Achievement Tests generally apply to more selective universities.

Mean 1991 SAT Verbal Scores
Entire Test Group/Students taking Achievement Tests

Group	National	Texas	HISD	Difference (HISD-Nation)
Entire Test Group	422	411	392	– 30
Students taking Achievement Tests	515	536	529	+ 14
Difference	93	125	137	

Mean 1991 SAT Math Scores
Entire Test Group/Students taking Achievement Tests

Group	National	Texas	HISD	Difference (HISD-Nation)
Entire Test Group	474	463	448	– 26
Students taking Achievement Tests	584	604	601	+ 17
Difference	110	141	153	

While the average SAT math and verbal scores for HISD as a whole are below those of the nation, the average SAT scores for those HISD students taking an Achievement Test are higher than the averages for comparable groups nationwide. Thus, the top students from HISD are comparable to the top students across the nation.

In HISD, 14% of the 1991 seniors with SAT scores also took an Achievement Test ; for the nation as a whole, the figure was 19%. The fact that few HISD students took an achievement test may signal either that HISD students have lower educational aspirations in terms of attending the more prestigious colleges and universities or, in line with the larger number of poor students in HISD, that the cost of the Achievement Tests cannot easily be met by many HISD students. While the SAT costs $16, a student must pay $21 for the chance to take up to three Achievement Tests.

Of note is the College Board's argument that the "difference in average scores between these top-scoring students and those in the middle signals a disturbing pattern of educational disparity in academic preparation."

Gender

The following tables give national, statewide, and HISD SAT results by gender.

Mean 1991 SAT Verbal Scores by Gender

Gender	National	Texas	HISD	Difference (HISD-Nation)
Men	426	416	397	- 29
Women	418	407	387	- 31
Difference	8	9	10	

Do the score differences associated with the relative performances of men and women help us understand HISD's overall performance? On the face of it, the differences between men's verbal scores and women's verbal scores seem comparable for the nation (8 points), the state (9 points), and HISD (10 points). Indeed, the differences in the proportions of men and women in the test groups for HISD and the nation (HISD: 45% men/55% women; Nation: 48% men/52% women) do not go far in explaining the differences in overall scores. If the national proportions were applied to HISD's mean scores by gender, HISD's overall mean score would rise only a quarter of a point. The mean scores for both men and women in HISD are well below the national means for each gender.

Mean 1991 SAT Math Scores by Gender

Gender	National	Texas	HISD	Difference (HISD-Nation)
Men	497	485	471	- 26
Women	453	443	429	- 24
Difference	44	42	42	

A similar conclusion must be reached when the scores and test group proportions for math are studied. The differences between the scores for men and women are comparable for the nation (44 points difference), the state (42 points), and HISD (42 points). If the proportions of men and women taking the test nationwide were applied to HISD's mean scores, the overall mean score for HISD would rise only one point, and HISD would still have a score well below that of the nation. As with the verbal scores, the mean math scores for both men and women in HISD are well below the national means for each gender. Thus, a look at gender does not advance our understanding HISD's scores very far.

Ethnicity

The following tables give national, statewide, and HISD SAT results by ethnicity.

Mean 1991 SAT Verbal Scores by Ethnicity

Ethnicity	National	Texas	HISD	Difference (HISD-Nation)
American Indian/Alaskan Native	393	393	381	– 12
Asian/Asian American/Pacific Isle	411	411	425	+ 14
Black/African American	351	344	343	– 8
Hispanic: Mexican Amer/Chicano	377	371	352	– 25
Puerto Rican	361	395	359	– 2
Other Hispanic	382	371	356	– 26
White	441	435	465	+ 24
Other	411	423	436	+ 25

The differences between the mean verbal scores for the various ethnic groups in HISD and their counterparts nationwide range from a 26 point deficit for HISD's "other Hispanic" group to a surplus of 25 points for HISD's "other" group. Mexican Americans in HISD scored 25 points below Mexican Americans nationwide; HISD's Black college-bound seniors scored 8 points below Black students nationwide; Asian students in HISD scored 14 points above Asian students nationwide; and White students in HISD scored 24 points higher than White students nationwide. At this point the meaning of the data in the earlier graph presenting a large gap between HISD and the nation breaks down. An overall average that collapses these large differences into a single number obfuscates rather than clarifies.

The differences in the proportion of each ethnicity forming the test groups for the nation and HISD do help explain the difference between national and district scores. Comparing the proportion of each ethnicity in the nationwide group to HISD's proportions should make this clearer. Nationwide, White students made up 72% of the test group; in HISD, White students were 32% of the test group. Nationwide, Black students are 10% of the test group; in HISD, Black students make up 36% of test-takers. Nationwide, 7% of the test group was made up of Hispanics while in Houston, 23% of the test group was Hispanic. If the proportions of each ethnicity forming the nationwide test group were applied to HISD's mean scores and an overall mean score was recalculated, HISD's verbal score would rise 48 points, ending 18 points higher than the national average.

The situation is similar for math scores.

Mean 1991 SAT Math Scores by Ethnicity

Ethnicity	National	Texas	HISD	Difference (Nation/HISD)
American Indian/Alaskan Native	437	435	418	– 19
Asian/Asian American/Pacific Isle	530	522	534	+ 4
Black/African American	385	385	390	+ 5
Hispanic: Mexican Amer/Chicano	427	423	418	– 9
Puerto Rican	406	446	447	+ 41
Other Hispanic	431	426	416	– 15
White	489	484	514	+ 25
Other	466	471	481	+ 15

In math, the differences between nationwide and HISD performance range from the 19 point deficit of HISD's American Indians to the 41 point surplus of HISD's Puerto Ricans. For the larger groups of test takers, HISD's Mexican Americans trail Mexican Americans nationwide by 9 points; "other" Hispanics in HISD are 15 points below their counterparts nationwide; HISD's Asian students scored an average of 4 points higher than Asian students nationwide; HISD's Black students averaged 5 points higher than Blacks nationwide; and HISD's White students averaged 25 points higher than White students nationwide.

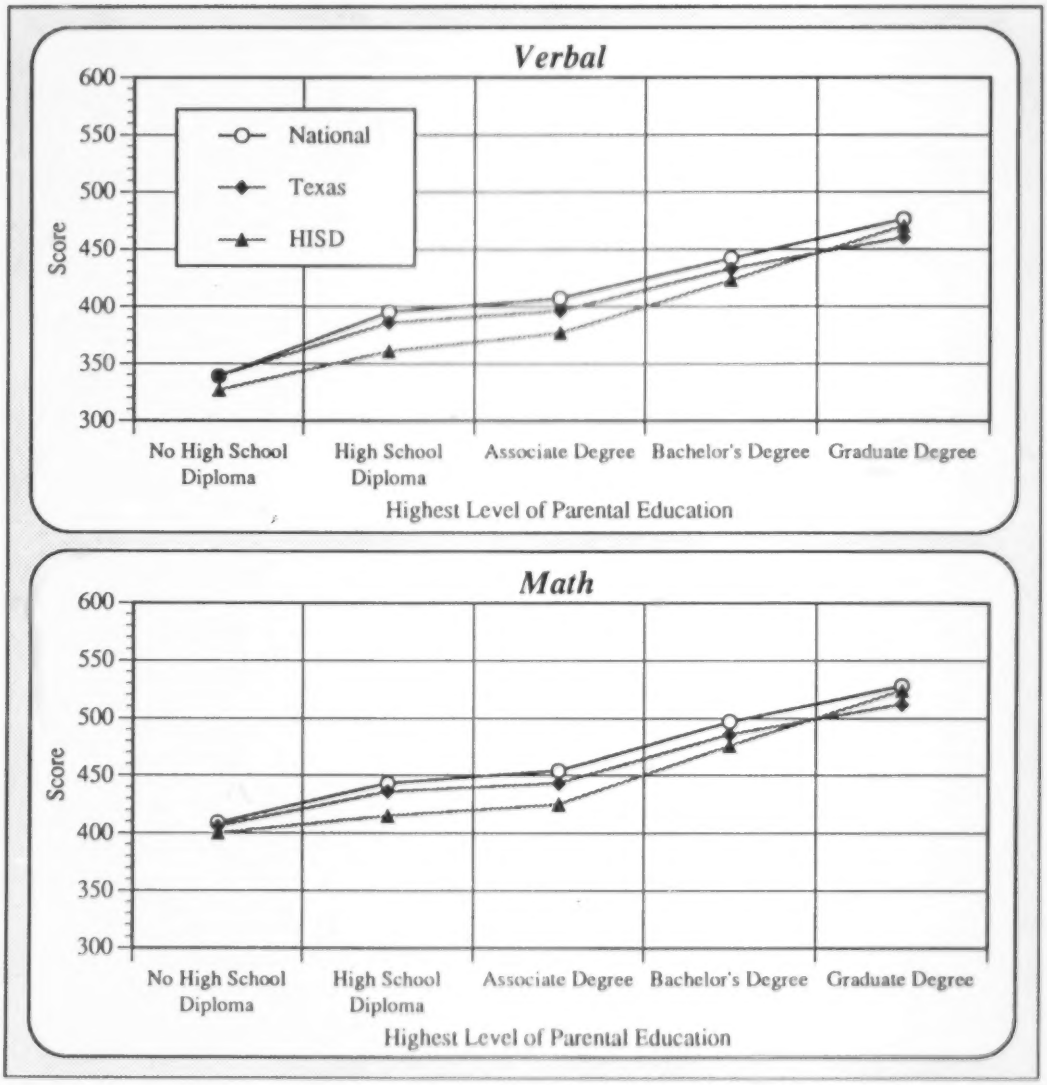
Again, the wide variations between the average scores of the various ethnic groups, nationwide, statewide and in HISD, make nonsense out of the attempt to rest satisfied with the derivation of an overall score as a measure of educational quality. If the proportions of each ethnicity forming the nationwide test group were applied to HISD's mean math scores and an overall mean score was recalculated, HISD's overall math average would rise 47 points and be 21 points higher than the national math average.

A genuine question of educational quality can, and must, be addressed, with the help of these score breakdowns. Are there large, identifiable groups of students who have a desire to go to college, who have been through the educational system, and who are yet unprepared for college work? The above tables that break down scores by ethnicity make it clear that there are such groups of students. For whatever reasons, HISD's White college-bound seniors averaged 122 points higher than HISD's Black college-bound seniors on the verbal test, and 113 points higher than HISD's Mexican American college-bound seniors. On the math test, White students scored 124 points higher than Black students and 96 points higher than HISD's Mexican American students. It is true that there are large disparities nationwide, not just at HISD. That simply means that current educational practice, nationwide as well as in HISD, has not yet come to terms with preparing large numbers of minority students for college-level work. Large, identifiable groups of students are not being adequately educated under the current system.

Parental Education

The graphs below give the mean scores for students at five levels of parental education.

Mean 1991 SAT Scores by
Highest Level of Parental Education
National/Texas/Houston ISD



The graphs related to levels of parental education mimic the graphs concerning household income. Mean SAT scores, for verbal and math ability, rise with the level of parental education.

The Parental Education Level graphs also mimic another feature of the earlier graphs. HISD's students who come from highly educated families earn SAT scores that are comparable

with other students from a similar background. On the other hand, HISD students from homes with less than a bachelor's degree clearly perform at a lower level than their counterparts nationwide.

On the verbal test, HISD students who have parents with graduate degrees averaged 470 while comparable students nationwide averaged 476. HISD students whose parents have only a high school diploma, however, averaged 361 on the verbal test while nationwide the average was 395. In math, HISD students with graduate degree parents averaged 524 while their counterparts nationwide averaged 528. Those HISD students whose parents have only a high school diploma averaged 415 in math; nationwide, the figure was 443.

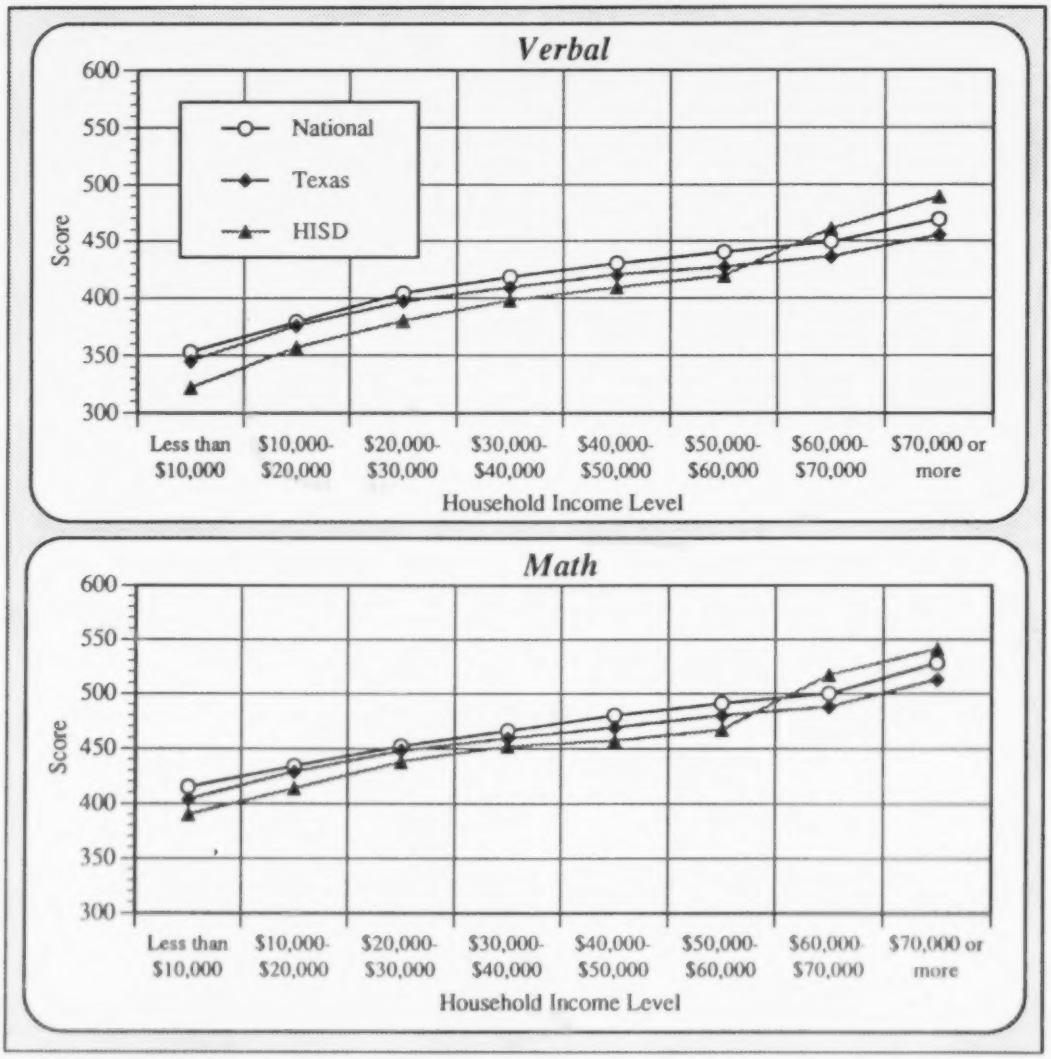
Thus, consistent with other indicators, HISD students who have highly educated parents can compete with their counterparts nationwide, while HISD students without highly educated parents perform below comparable students nationwide.

The main lesson, again, does not arise from the differences between HISD and the nation as a whole, but rather from the association of higher SAT scores, and thus higher levels of college preparedness, with higher levels of parental education. That lesson is that the educational approach current throughout the United States is competent at preparing students from privileged backgrounds for college work but has not yet come to terms with the mandate to adequately educate students who do not come from homes with a tradition of educational achievement.

Household Income Level

The graphs below give the mean scores for students at eight levels of household income.

Mean 1991 SAT Scores by Household Income Level
National/Texas/Houston ISD



The first feature of note about the Household Income graphs is the fact that SAT scores seem to rise as income level rises. Conversely, the demonstrated ability to successfully perform college-level work is not much in evidence for students from low income families, either in HISD, the state, or the nation.

These two graphs show similar patterns. In both verbal and math ability, HISD's affluent students score as high or higher than such students nationwide, but HISD students from poor and

middle income homes score lower than such students nationwide. On the verbal test, HISD students with parents making over $70,000 averaged 489; nationwide, the average was 469. On the other end of the scale, HISD's poorest group of students averaged 322 on the verbal test; nationwide, the average was 353. On math, HISD students with parents making over $70,000 annually averaged 541; nationally, such students averaged 528. HISD students whose parents make less than $10,000 averaged 390 on the math test while nationwide the average was 415.

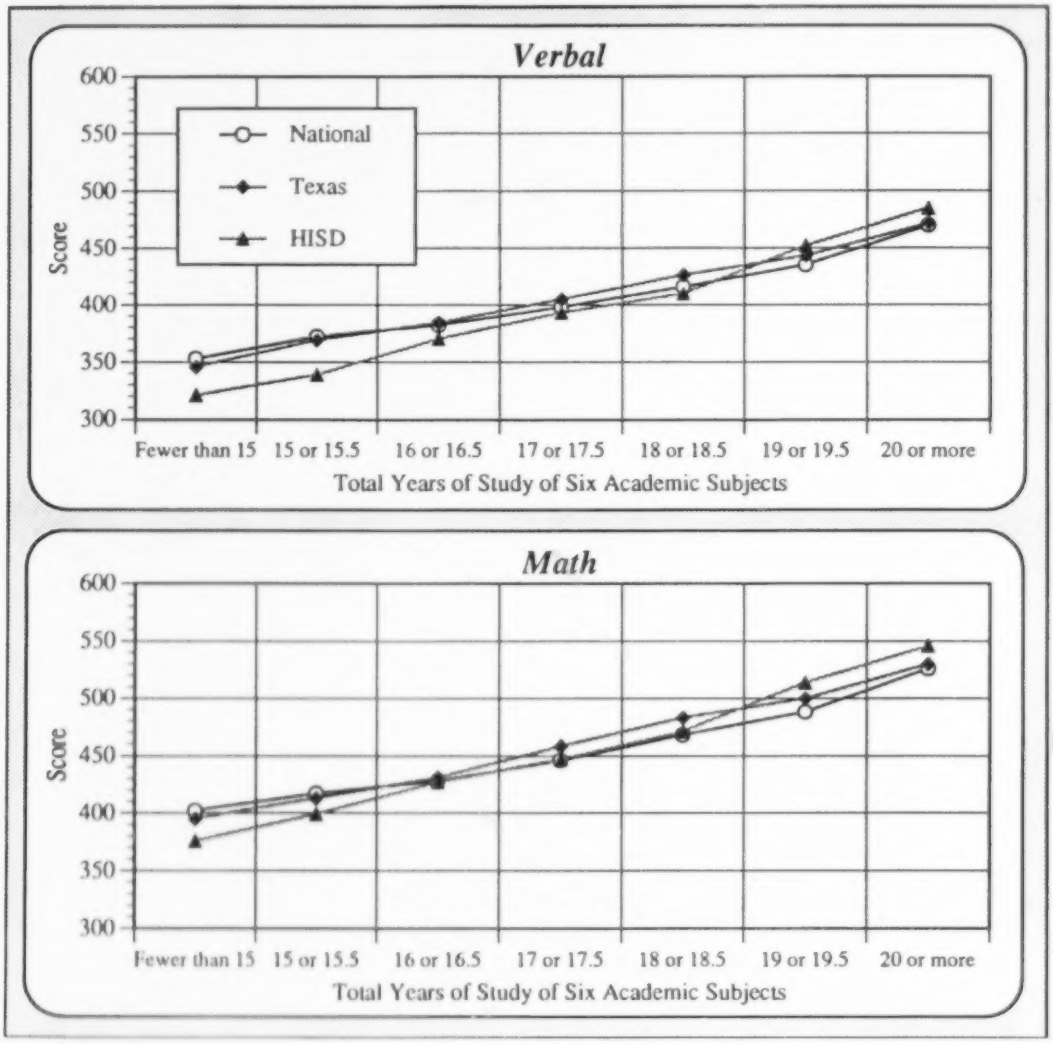
The proportions of students in the test groups should be noted. In HISD, 30% of test-takers come from families making $40,000 or more; nationally, the figure is 50%. At the poorer end, 56% of HISD's test-takers come from families with incomes of $30,000 or less. Nationally, only 31% fit this criteria.

Thus, while HISD's top students are as prepared for college work as anyone, HISD's poor students are even less ready for college-level work than their counterparts nationwide. The poor students in HISD score lower than their counterparts nationwide, and there are more of them. The central lesson from this analysis, however, does not depend upon poor HISD students scoring lower than poor students nationwide. The fact that the average scores rise so steeply and so consistently with income level indicates that neither HISD, the state, nor the nation has really come to terms with the task of preparing poor students for college.

Total Years of Study in Six Academic Subjects

The graphs below give the mean scores for students at seven levels of academic preparation, based on the combined number of years of high school study in Arts and Music, English, Foreign and Classical Languages, Mathematics, Natural Sciences, and Social Sciences.

Mean 1991 SAT Scores by
Total Years of Study in Six Academic Subjects
National/Texas/Houston ISD



In HISD, students with fewer than 15 years of academic coursework averaged 321 on the verbal test; nationwide, the average was 353. At the top end, HISD's students with the most coursework averaged 485, as opposed to 470 nationwide. In math, HISD students with fewer

than 15 years of academic coursework averaged 376; nationwide in math, such students averaged 402. For the students with the most academic coursework, the HISD average in math was 546; nationwide, the average was 526. Thus, in both verbal and quantitative ability, the top portion of HISD's students are on a par with the top students nationwide. However, at the lower end of preparation, HISD's students score lower than comparable students nationwide.

One alarming feature of note is the fact that while 53% of test-takers nationwide fell into the top two categories, having 19 or more years of academic coursework, only 30% of HISD's test-takers had similar levels of preparation. Likewise, 43% of HISD's test-takers fall into the bottom three preparation categories, having fewer than 17 years combined academic coursework, compared to only 24% of the nationwide group. Thus, not only do the HISD students who are least prepared for college academically score lower than their counterparts nationwide, but there are a greater proportion of these students in HISD, wishing to pursue a college career and lacking the necessary preparation for such an undertaking.

Verbal Subscores

The tables below present national, state and district scores on the Reading Comprehension and the Vocabulary sections of the verbal test, by gender. The subscore scale ranges from 20 to 80.

Mean Reading Comprehension Scores by Gender National/Texas/HISD

Test Group	National	Texas	HISD	Difference (HISD-Nation)
All	42.3	41.2	39.2	– 3.1
Male	42.5	41.6	39.6	– 2.9
Female	42.0	40.8	38.9	– 3.1
Difference (Male/Female)	0.5	0.8	0.7	

Mean Vocabulary Scores by Gender National/Texas/HISD

Test Group	National	Texas	HISD	Difference (HISD-Nation)
All	42.2	41.1	39.5	– 2.7
Male	42.8	41.6	40.2	– 2.6
Female	41.7	40.6	38.9	– 2.8
Difference (Male/Female)	1.1	1.0	1.3	

Of note are the facts that the average HISD score in vocabulary is higher than the score for reading comprehension and that the HISD vocabulary average is closer to the national score than the reading comprehension average.

Test of Standard Written English (TSWE)

The table below gives average scores for the Test of Standard Written English (TSWE) for the nation, the state and the district.

Mean TSWE Scores by Gender
National/Texas/HISD

Test Group	National	Texas	HISD	Difference (HISD-Nation)
All	42.1	41.7	39.9	– 2.2
Male	41.4	41.0	39.2	– 2.2
Female	42.8	42.3	40.5	– 2.3
Difference (Male/Female)	1.4	1.3	1.3	

Of note is the fact that, while men outperformed women on both subscores of the verbal SAT, women scored higher than men on the TSWE, at all three levels of aggregation.

Improving HISD's SAT Performance

The Texas Research League recommended, in the July 1991 newsletter *Analysis*, a number of steps to improve the SAT performance of students in Texas. The Texas Education Agency has also published several "tips" for schools in the hope of improving college entrance scores. The recommendations from these two sources are summarized below:

- urge more students to participate in college admission testing programs;
- publicize the kind and amount of academic training that is needed in high school to be adequately prepared for college-level work;
- encourage more women to take more math and science courses;
- focus on developing English skills;
- motivate minorities to take more advanced academic courses;
- induce students to take more academic courses;
- make truly rigorous, challenging and advanced courses available;
- inspire high expectations among students, especially those with disadvantaged backgrounds;
- urge under-educated parents to gain additional education;
- provide training in test taking skills.

It should be evident that such strategies are not designed simply to raise scores, but to truly enable more students and more kinds of students to perform college-level work at an acceptable level.

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